U.S. Department
of Transportation
Federal Aviation
Administration

FAA-E-2871
November 16, 1990

U.S. Department of Transportation

Federal Aviation Administration Specification

DISTANCE MEASURING EQUIPMENT
DME

Contents

MIL-STD-785	Reliability Program for Systems and Equipment Development and Production
MIL-STD-1189	Bar Coding Symbology
MIL-STD-1388-1A	Logistics Support Analysis
MIL-STD-1388-2A	Logistics Support Analysis Record
MIL-STD-1521	Technical Reviews and Audits for Systems, Equipments and Computer Programs
MIL-STD-1561	Uniform DOD Provisioning Procedures

OTHER PUBLICATIONS

MIL-HDBK-217	Reliability Predictions of Electronic Equipment
FCC Document	Federal Communications Commission, Rules and Regulations, Part 2, Part 15, Part 68
NTIA Manual	National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management

2.2 Non-Government documents.-

2.2.1 Industrial standards.-

EIA-RS-232-C	Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange

Copies of FAA documents may be obtained from the Contracting Officer in the Federal Aviation Administration Office issuing the invitation for bids or request for proposals. Requests should fully identify materials desired and should cite the invitation for bids, request for proposals or the contract involved or other use to be made of the requested material.

Copies of military standards, specifications and handbooks may be requested from the U.S. Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania, 19120, (215) 679-3321.

Copies of the EIA Standard may be obtained from the Electronic Industries Association Engineering Department, 2110 I Street, N.W., Washington, DC 20006. Copies of Federal specifications and standards may be obtained from General Services Administra-

MIL-STD-785	Reliability Program for Systems and Equipment Development and Production
MIL-STD-1189	Bar Coding Symbology
MIL-STD-1388-1A	Logistics Support Analysis
MIL-STD-1388-2A	Logistics Support Analysis Record
MIL-STD-1521	Technical Reviews and Audits for Systems, Equipments and Computer Programs
MIL-STD-1561	Uniform DOD Provisioning Procedures

OTHER PUBLICATIONS

MIL-HDBK-217	Reliability Predictions of Electronic Equipment
FCC Document	Federal Communications Commission, Rules and Regulations, Part 2, Part 15, Part 68
NTIA Manual	National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management

2.2 Non-Government documents.-

2.2.1 Industrial standards.-

EIA-RS-232-C	Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange

Copies of FAA documents may be obtained from the Contracting Officer in the Federal Aviation Administration Office issuing the invitation for bids or request for proposals. Requests should fully identify materials desired and should cite the invitation for bids, request for proposals or the contract involved or other use to be made of the requested material.

Copies of military standards, specifications and handbooks may be requested from the U.S. Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania, 19120, (215) 679-3321.

Copies of the EIA Standard may be obtained from the Electronic Industries Association Engineering Department, 2110 I Street, N.W., Washington, DC 20006. Copies of Federal specifications and standards may be obtained from General Services Administra-

MIL-STD-785	Reliability Program for Systems and Equipment Development and Production
MIL-STD-1189	Bar Coding Symbology
MIL-STD-1388-1A	Logistics Support Analysis
MIL-STD-1388-2A	Logistics Support Analysis Record
MIL-STD-1521	Technical Reviews and Audits for Systems, Equipments and Computer Programs
MIL-STD-1561	Uniform DOD Provisioning Procedures

OTHER PUBLICATIONS

MIL-HDBK-217	Reliability Predictions of Electronic Equipment
FCC Document	Federal Communications Commission, Rules and Regulations, Part 2, Part 15, Part 68
NTIA Manual	National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management

2.2 Non-Government documents.-

2.2.1 Industrial standards.-

EIA-RS-232-C	Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange

Copies of FAA documents may be obtained from the Contracting Officer in the Federal Aviation Administration Office issuing the invitation for bids or request for proposals. Requests should fully identify materials desired and should cite the invitation for bids, request for proposals or the contract involved or other use to be made of the requested material.

Copies of military standards, specifications and handbooks may be requested from the U.S. Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania, 19120, (215) 679-3321.

Copies of the EIA Standard may be obtained from the Electronic Industries Association Engineering Department, 2110 I Street, N.W., Washington, DC 20006. Copies of Federal specifications and standards may be obtained from General Services Administra-

MIL-STD-785	Reliability Program for Systems and Equipment Development and Production
MIL-STD-1189	Bar Coding Symbology
MIL-STD-1388-1A	Logistics Support Analysis
MIL-STD-1388-2A	Logistics Support Analysis Record
MIL-STD-1521	Technical Reviews and Audits for Systems, Equipments and Computer Programs
MIL-STD-1561	Uniform DOD Provisioning Procedures

OTHER PUBLICATIONS

MIL-HDBK-217	Reliability Predictions of Electronic Equipment
FCC Document	Federal Communications Commission, Rules and Regulations, Part 2, Part 15, Part 68
NTIA Manual	National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management

2.2 Non-Government documents.-

2.2.1 Industrial standards.-

EIA-RS-232-C	Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange

Copies of FAA documents may be obtained from the Contracting Officer in the Federal Aviation Administration Office issuing the invitation for bids or request for proposals. Requests should fully identify materials desired and should cite the invitation for bids, request for proposals or the contract involved or other use to be made of the requested material.

Copies of military standards, specifications and handbooks may be requested from the U.S. Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania, 19120, (215) 679-3321.

Copies of the EIA Standard may be obtained from the Electronic Industries Association Engineering Department, 2110 I Street, N.W., Washington, DC 20006. Copies of Federal specifications and standards may be obtained from General Services Administra-

neously initiates local and remote alarm indications. In normal unattended operation of the facility these 'actions are automatic.

3.1.17.1 Monitor fail safe.- A principle which states that a failure in the executive monitor itself must result in an alarm (3.1.12).

3.1.17.2 Monitor happy.- The condition where the executive monitor senses that the'monitored signal parameters are within established tolerances and provides local and remote indication of normal operation.

3.1.17.3 Monitor unhappy.- Same as fault condition (3.1.11).

3.1.17.4 Monitor bypass.- A feature which allows a technician to override the normal functions of the executive monitor to permit operation of an equipment for troubleshooting purposes.

3.1.18 Operating transponder.- A transponder which is energized and radiating signals through the ground station antenna.

3.1.19 Module.- Two or more parts which form a portion of an assembly or a unit replaceable as a whole but having parts which are individually replaceable.

3.1.19.1 Unit.- A functional assembly of components and modules.

3.1.19.2 Line replaceable unit (LRU).- An item which may consist of a unit, an assembly (circuit card assembly, electronic component assembly, etc.) a subassembly, or a part, that is removed and replaced at the site maintenance level in order to restore the system/equipment to its operational status.

3.1.20 Automatic operation.- Refers to normal unattended operation of a transponder and associated equipment under control of the executive monitor (3.1.17). In this mode of operation the transponder remains in operation until the executive monitor senses an alarm, whereupon the transponder is deenergized.

3.1.21 Facility central processing unit (FCPU).- The FCPU (not to be furnished under this specification) is an integral part of the existing FA-9996 VOR system. The core of the FCPU is the microprocessor with its associated memory, A/D converters and interface controls. The FCPU oversees: (1) automatic fault isolation to the LRU level; (2) adjustment, testing and control of the DME equipment through appropriate equipment and external interfaces; (3) certification testing; (4) monitor integrity testing; (5) system security management and control; (6) DME shutdown and reset control; (7) communications control to local operator and remote station; (8) maintenance data collections: and, (9) collection and dispatching of real time status information. The FCPU stores and transmits all data available for use at the remote site. The FCPU software stores all data (faults, alarms and shutdowns) for future availability and historical record keeping. The FCPU interfaces locally with the DME equip-

neously initiates local and remote alarm indications. In normal unattended operation of the facility these 'actions are automatic.

3.1.17.1 Monitor fail safe.- A principle which states that a failure in the executive monitor itself must result in an alarm (3.1.12).

3.1.17.2 Monitor happy.- The condition where the executive monitor senses that the' monitored signal parameters are within established tolerances and provides local and remote indication of normal operation.

3.1.17.3 Monitor unhappy.- Same as fault condition (3.1.11).

3.1.17.4 Monitor bypass.- A feature which allows a technician to override the normal functions of the executive monitor to permit operation of an equipment for troubleshooting purposes.

3.1.18 Operating transponder.- A transponder which is energized and radiating signals through the ground station antenna.

3.1.19 Module.- Two or more parts which form a portion of an assembly or a unit replaceable as a whole but having parts which are individually replaceable.

3.1.19.1 Unit.- A functional assembly of components and modules.

3.1.19.2 Line replaceable unit (LRU).- An item which may consist of a unit, an assembly (circuit card assembly, electronic component assembly, etc.) a subassembly, or a part, that is removed and replaced at the site maintenance level in order to restore the system/equipment to its operational status.

3.1.20 Automatic operation.- Refers to normal unattended operation of a transponder and associated equipment under control of the executive monitor (3.1.17). In this mode of operation the transponder remains in operation until the executive monitor senses an alarm, whereupon the transponder is deenergized.

3.1.21 Facility central processing unit (FCPU).- The FCPU (not to be furnished under this specification) is an integral part of the existing FA-9996 VOR system. The core of the FCPU is the microprocessor with its associated memory, A/D converters and interface controls. The FCPU oversees: (1) automatic fault isolation to the LRU level; (2) adjustment, testing and control of the DME equipment through appropriate equipment and external interfaces; (3) certification testing; (4) monitor integrity testing; (5) system security management and control; (6) DME shutdown and reset control; (7) communications control to local operator and remote station; (8) maintenance data collections: and, (9) collection and dispatching of real time status information. The FCPU stores and transmits all data available for use at the remote site. The FCPU software stores all data (faults, alarms and shutdowns) for future availability and historical record keeping. The FCPU interfaces locally with the DME equip-

neously initiates local and remote alarm indications. In normal unattended operation of the facility these 'actions are automatic.

3.1.17.1 Monitor fail safe.- A principle which states that a failure in the executive monitor itself must result in an alarm (3.1.12).

3.1.17.2 Monitor happy.- The condition where the executive monitor senses that the' monitored signal parameters are within established tolerances and provides local and remote indication of normal operation.

3.1.17.3 Monitor unhappy.- Same as fault condition (3.1.11).

3.1.17.4 Monitor bypass.- A feature which allows a technician to override the normal functions of the executive monitor to permit operation of an equipment for troubleshooting purposes.

3.1.18 Operating transponder.- A transponder which is energized and radiating signals through the ground station antenna.

3.1.19 Module.- Two or more parts which form a portion of an assembly or a unit replaceable as a whole but having parts which are individually replaceable.

3.1.19.1 Unit.- A functional assembly of components and modules.

3.1.19.2 Line replaceable unit (LRU).- An item which may consist of a unit, an assembly (circuit card assembly, electronic component assembly, etc.) a subassembly, or a part, that is removed and replaced at the site maintenance level in order to restore the system/equipment to its operational status.

3.1.20 Automatic operation.- Refers to normal unattended operation of a transponder and associated equipment under control of the executive monitor (3.1.17). In this mode of operation the transponder remains in operation until the executive monitor senses an alarm, whereupon the transponder is deenergized.

3.1.21 Facility central processing unit (FCPU).- The FCPU (not to be furnished under this specification) is an integral part of the existing FA-9996 VOR system. The core of the FCPU is the microprocessor with its associated memory, A/D converters and interface controls. The FCPU oversees: (1) automatic fault isolation to the LRU level; (2) adjustment, testing and control of the DME equipment through appropriate equipment and external interfaces; (3) certification testing; (4) monitor integrity testing; (5) system security management and control; (6) DME shutdown and reset control; (7) communications control to local operator and remote station; (8) maintenance data collections: and, (9) collection and dispatching of real time status information. The FCPU stores and transmits all data available for use at the remote site. The FCPU software stores all data (faults, alarms and shutdowns) for future availability and historical record keeping. The FCPU interfaces locally with the DME equip-

neously initiates local and remote alarm indications. In normal unattended operation of the facility these 'actions are automatic.

3.1.17.1 Monitor fail safe.- A principle which states that a failure in the executive monitor itself must result in an alarm (3.1.12).

3.1.17.2 Monitor happy.- The condition where the executive monitor senses that the monitored signal parameters are within established tolerances and provides local and remote indication of normal operation.

3.1.17.3 Monitor unhappy.- Same as fault condition (3.1.11).

3.1.17.4 Monitor bypass.- A feature which allows a technician to override the normal functions of the executive monitor to permit operation of an equipment for troubleshooting purposes.

3.1.18 Operating transponder.- A transponder which is energized and radiating signals through the ground station antenna.

3.1.19 Module.- Two or more parts which form a portion of an assembly or a unit replaceable as a whole but having parts which are individually replaceable.

3.1.19.1 Unit.- A functional assembly of components and modules.

3.1.19.2 Line replaceable unit (LRU).- An item which may consist of a unit, an assembly (circuit card assembly, electronic component assembly, etc.) a subassembly, or a part, that is removed and replaced at the site maintenance level in order to restore the system/equipment to its operational status.

3.1.20 Automatic operation.- Refers to normal unattended operation of a transponder and associated equipment under control of the executive monitor (3.1.17). In this mode of operation the transponder remains in operation until the executive monitor senses an alarm, whereupon the transponder is deenergized.

3.1.21 Facility central processing unit (FCPU).- The FCPU (not to be furnished under this specification) is an integral part of the existing FA-9996 VOR system. The core of the FCPU is the microprocessor with its associated memory, A/D converters and interface controls. The FCPU oversees: (1) automatic fault isolation to the LRU level; (2) adjustment, testing and control of the DME equipment through appropriate equipment and external interfaces; (3) certification testing; (4) monitor integrity testing; (5) system security management and control; (6) DME shutdown and reset control; (7) communications control to local operator and remote station; (8) maintenance data collections: and, (9) collection and dispatching of real time status information. The FCPU stores and transmits all data available for use at the remote site. The FCPU software stores all data (faults, alarms and shutdowns) for future availability and historical record keeping. The FCPU interfaces locally with the DME equip-

operation on a channel assigned in accordance with the provisions contained in the contract schedule prior to shipment. (See Table 1 for channel frequencies and pairings.)

Each DME equipment set shall consist of the following functional elements:

	Elements	Quantity/set
1.	DME Transponder	1
2.	DME Monitor .	2
3.	All required operational and maintenance software	1

3.3 Equipment characteristics.- The subparagraphs below contain requirements applicable to all equipment items required by the contract referencing this specification..

3.3.1 Equipment physical design and packaging.- The equipment shall be designed, configured, and packaged in such a manner as to facilitate the' accomplishment via either front, side or top access of all test, adjustment, and maintenance operations. All of the equipment components provided for installation at the facility location shall be housed in not more than one cabinet (3.3.1.1). All unused front panel space shall be covered by blank panels. Front panels provided for access to cabinet main frame terminal boards shall be mounted by means of quick- disconnect fasteners.

3.3.1.1 Equipment cabinet.- The DME electronic units shall be housed in an aluminum or steel cabinet designed to be mounted inside an existing Government furnished equipment shelter. Cabinet material shall be of steel or aluminum alloy suitable for the application. The thickness of the material and method of forming and reinforcing shall be such as to result in a rigid assembly capable of supporting all the equipment while in a fully opened or closed position without twisting or warping the cabinet.

3.3.1.2 Cabinet details.- The equipment cabinet shall include a grounding-type convenience outlet box mounted on the bottom front of the cabinet. The cabinet shall have two top openings with easily removable cover plates for cable entrance and egress. The openings shall be designed to accommodate standard four inch square duct. Complete cabinet installation details shall be provided in the installation section (9) of the equipment instruction book. All material and hardware required for the installation of the cabinet shall be provided under this specification and the contract 'schedule.

3.3.1.3 Equipment unit construction.- Major assemblies or units shall be designed to be completely removable from their enclosures without disassembly. Complete access shall be provided to all units, modules, assemblies or subassemblies from outside the

operation on a channel assigned in accordance with the provisions contained in the contract schedule prior to shipment. (See Table 1 for channel frequencies and pairings.)

Each DME equipment set shall consist of the following functional elements:

	Elements	Quantity/set
1.	DME Transponder	1
2.	DME Monitor .	2
3.	All required operational and maintenance software	1

<u>3.3 Equipment characteristics</u>.- The subparagraphs below contain requirements applicable to all equipment items required by the contract referencing this specification..

<u>3.3.1 Equipment physical design and packaging</u>.- The equipment shall be designed, configured, and packaged in such a manner as to facilitate the' accomplishment via either front, side or top access of all test, adjustment, and maintenance operations. All of the equipment components provided for installation at the facility location shall be housed in not more than one cabinet (3.3.1.1). All unused front panel space shall be covered by blank panels. Front panels provided for access to cabinet main frame terminal boards shall be mounted by means of quick- disconnect fasteners.

<u>3.3.1.1 Equipment cabinet</u>.- The DME electronic units shall be housed in an aluminum or steel cabinet designed to be mounted inside an existing Government furnished equipment shelter. Cabinet material shall be of steel or aluminum alloy suitable for the application. The thickness of the material and method of forming and reinforcing shall be such as to result in a rigid assembly capable of supporting all the equipment while in a fully opened or closed position without twisting or warping the cabinet.

<u>3.3.1.2 Cabinet details</u>.- The equipment cabinet shall include a grounding-type convenience outlet box mounted on the bottom front of the cabinet. The cabinet shall have two top openings with easily removable cover plates for cable entrance and egress. The openings shall be designed to accommodate standard four inch square duct. Complete cabinet installation details shall be provided in the installation section (9) of the equipment instruction book. All material and hardware required for the installation of the cabinet shall be provided under this specification and the contract 'schedule.

<u>3.3.1.3 Equipment unit construction</u>.- Major assemblies or units shall be designed to be completely removable from their enclosures without disassembly. Complete access shall be provided to all units, modules, assemblies or subassemblies from outside the

operation on a channel assigned in accordance with the provisions contained in the contract schedule prior to shipment. (See Table 1 for channel frequencies and pairings.)

Each DME equipment set shall consist of the following functional elements:

Elements	Quantity/set
1. DME Transponder	1
2. DME Monitor .	2
3. All required operational and maintenance software	1

3.3 Equipment characteristics.- The subparagraphs below contain requirements applicable to all equipment items required by the contract referencing this specification..

3.3.1 Equipment physical design and packaging.- The equipment shall be designed, configured, and packaged in such a manner as to facilitate the' accomplishment via either front, side or top access of all test, adjustment, and maintenance operations. All of the equipment components provided for installation at the facility location shall be housed in not more than one cabinet (3.3.1.1). All unused front panel space shall be covered by blank panels. Front panels provided for access to cabinet main frame terminal boards shall be mounted by means of quick- disconnect fasteners.

3.3.1.1 Equipment cabinet.- The DME electronic units shall be housed in an aluminum or steel cabinet designed to be mounted inside an existing Government furnished equipment shelter. Cabinet material shall be of steel or aluminum alloy suitable for the application. The thickness of the material and method of forming and reinforcing shall be such as to result in a rigid assembly capable of supporting all the equipment while in a fully opened or closed position without twisting or warping the cabinet.

3.3.1.2 Cabinet details.- The equipment cabinet shall include a grounding-type convenience outlet box mounted on the bottom front of the cabinet. The cabinet shall have two top openings with easily removable cover plates for cable entrance and egress. The openings shall be designed to accommodate standard four inch square duct. Complete cabinet installation details shall be provided in the installation section (9) of the equipment instruction book. All material and hardware required for the installation of the cabinet shall be provided under this specification and the contract 'schedule.

3.3.1.3 Equipment unit construction.- Major assemblies or units shall be designed to be completely removable from their enclosures without disassembly. Complete access shall be provided to all units, modules, assemblies or subassemblies from outside the

in non-volatile memory(s) of current status data of all monitored transponder parameters and the upper and lower monitor fault/threshold alarm limits, also last routine sample data, and post-fault (but prior to alarm) data.- Stored data shall be available via polling or request.

3.3.9 Output circuit protection.- All equipment output circuits and transponder output circuits shall be protected in accordance with the requirements of paragraph 3.3.2.2 of Specification FAA-G-2100.

3.3.10 Printed wiring and printed wiring boards.- All printed wiring boards, except strip line, shall be of-the plug-in card type and shall be mechanically coded and keyed in such a manner that only properly coded boards can be inserted. For purposes of this specification, strip line devices are classed as printed wiring. Sockets conforming to MIL-S-12883 or MIL-S-83734 shall be provided for the mounting of microprocessors and ROM integrated circuits. (Modifies paragraph 3.5.5.21.1 of FAA-G-2100).

3.3.11 Cross-talk, shielding, and isolation.- The arrangement of parts and wiring and the design of the equipment shall be such that cross-talk and unnecessary coupling between circuits cannot result in conditions of operation which are beyond the values allowed for the specified performance characteristics. Adequate shielding and other means of isolation shall be provided as necessary to prevent the occurrence of significant changes in signal levels, waveforms, timing, tuning, or operating conditions with any combination of open access doors; withdrawn chassis, or with printed wiring extender boards (3.3.1.4) in use. Also, the positioning of wires or cables shall not affect the operating conditions or performance of the equipment.

3.3.12 Adjustments.- The DME equipment shall be designed such that all transponder, monitor and control adjustments essential for proper operation and maintenance (other than tuning of RF stages or where otherwise indicated herein) and all indications resulting therefrom shall be accessible locally via the FCPU to IOT interface (3.1.21) or remotely in accordance with paragraph 3.3.12.3 herein.

3.3.12.1 Adjustment display.- An IOT in local mode of operation connected to the FCPU terminal interface shall be capable of displaying all control settings. For purposes of making adjustments, parameters must be selectable in accordance with the Government prepared interface control document (ICD) which is to be provided as part of-the contract schedule. The ability to adjust a parameter setting in minimum steps consistent with individual parameter tolerances must be provided together with the ability to directly enter a parameter setting from the IOT terminal keyboard.

3.3.12.2 Adjustment storage.- Electronically entered control settings must be stored in non-volatile memory either immediately upon entry or at the conclusion of an adjustment/maintenance operation. Storing of control settings shall be automatic and

in non-volatile memory(s) of current status data of all monitored transponder parameters and the upper and lower monitor fault/threshold alarm limits, also last routine sample data, and post-fault (but prior to alarm) data.- Stored data shall be available via polling or request.

3.3.9 Output circuit protection.- All equipment output circuits and transponder output circuits shall be protected in accordance with the requirements of paragraph 3.3.2.2 of Specification FAA-G-2100.

3.3.10 Printed wiring and printed wiring boards.- All printed wiring boards, except strip line, shall be of-the plug-in card type and shall be mechanically coded and keyed in such a manner that only properly coded boards can be inserted. For purposes of this specification, strip line devices are classed as printed wiring. Sockets conforming to MIL-S-12883 or MIL-S-83734 shall be provided for the mounting of microprocessors and ROM integrated circuits. (Modifies paragraph 3.5.5.21.1 of FAA-G-2100).

3.3.11 Cross-talk, shielding, and isolation.- The arrangement of parts and wiring and the design of the equipment shall be such that cross-talk and unnecessary coupling between circuits cannot result in conditions of operation which are beyond the values allowed for the specified performance characteristics. Adequate shielding and other means of isolation shall be provided as necessary to prevent the occurrence of significant changes in signal levels, waveforms, timing, tuning, or operating conditions with any combination of open access doors; withdrawn chassis, or with printed wiring extender boards (3.3.1.4) in use. Also, the positioning of wires or cables shall not affect the operating conditions or performance of the equipment.

3.3.12 Adjustments.- The DME equipment shall be designed such that all transponder, monitor and control adjustments essential for proper operation and maintenance (other than tuning of RF stages or where otherwise indicated herein) and all indications resulting therefrom shall be accessible locally via the FCPU to IOT interface (3.1.21) or remotely in accordance with paragraph 3.3.12.3 herein.

3.3.12.1 Adjustment display.- An IOT in local mode of operation connected to the FCPU terminal interface shall be capable of displaying all control settings. For purposes of making adjustments, parameters must be selectable in accordance with the Government prepared interface control document (ICD) which is to be provided as part of-the contract schedule. The ability to adjust a parameter setting in minimum steps consistent with individual parameter tolerances must be provided together with the ability to directly enter a parameter setting from the IOT terminal keyboard.

3.3.12.2 Adjustment storage.- Electronically entered control settings must be stored in non-volatile memory either immediately upon entry or at the conclusion of an adjustment/maintenance operation. Storing of control settings shall be automatic and

in non-volatile memory(s) of current status data of all monitored transponder parameters and the upper and lower monitor fault/threshold alarm limits, also last routine sample data, and post-fault (but prior to alarm) data.- Stored data shall be available via polling or request.

3.3.9 Output circuit protection.- All equipment output circuits and transponder output circuits shall be protected in accordance with the requirements of paragraph 3.3.2.2 of Specification FAA-G-2100.

3.3.10 Printed wiring and printed wiring boards.- All printed wiring boards, except strip line, shall be of-the plug-in card type and shall be mechanically coded and keyed in such a manner that only properly coded boards can be inserted. For purposes of this specification, strip line devices are classed as printed wiring. Sockets conforming to MIL-S-12883 or MIL-S-83734 shall be provided for the mounting of microprocessors and ROM integrated circuits. (Modifies paragraph 3.5.5.21.1 of FAA-G-2100).

3.3.11 Cross-talk, shielding, and isolation.- The arrangement of parts and wiring and the design of the equipment shall be such that cross-talk and unnecessary coupling between circuits cannot result in conditions of operation which are beyond the values allowed for the specified performance characteristics. Adequate shielding and other means of isolation shall be provided as necessary to prevent the occurrence of significant changes in signal levels, waveforms, timing, tuning, or operating conditions with any combination of open access doors; withdrawn chassis, or with printed wiring extender boards (3.3.1.4) in use.. Also, the positioning of wires or cables shall not affect the operating conditions or performance of the equipment.

3.3.12 Adjustments.- The DME equipment shall be designed such that all transponder, monitor and control adjustments essential for proper operation and maintenance (other than tuning of RF stages or where otherwise indicated herein) and all indications resulting therefrom shall be accessible locally via the FCPU to IOT interface (3.1.21) or remotely in accordance with paragraph 3.3.12.3 herein.

3.3.12.1 Adjustment display.- An IOT in local mode of operation connected to the FCPU terminal interface shall be capable of displaying all control settings. For purposes of making adjust-ments, parameters must be selectable in accordance with the Government prepared interface control document (ICD) which is to be provided as part of-the contract schedule. The ability to adjust a parameter setting in minimum steps consistent with individual parameter tolerances must be provided together with the ability to directly enter a parameter setting from the IOT terminal keyboard.

3.3.12.2 Adjustment storage.- Electronically entered control settings must be stored in non-volatile memory either immediately upon entry or at the conclusion of an adjustment/maintenance operation. Storing of control settings shall be automatic and

in non-volatile memory(s) of current status data of all monitored transponder parameters and the upper and lower monitor fault/threshold alarm limits, also last routine sample data, and post-fault (but prior to alarm) data.- Stored data shall be available via polling or request.

<u>3.3.9 Output circuit protection</u>.- All equipment output circuits and transponder output circuits shall be protected in accordance with the requirements of paragraph 3.3.2.2 of Specification FAA-G-2100.

<u>3.3.10 Printed wiring and printed wiring boards</u>.- All printed wiring boards, except strip line, shall be of-the plug-in card type and shall be mechanically coded and keyed in such a manner that only properly coded boards can be inserted. For purposes of this specification, strip line devices are classed as printed wiring. Sockets conforming to MIL-S-12883 or MIL-S-83734 shall be provided for the mounting of microprocessors and ROM integrated circuits. (Modifies paragraph 3.5.5.21.1 of FAA-G-2100).

<u>3.3.11 Cross-talk, shielding, and isolation</u>.- The arrangement of parts and wiring and the design of the equipment shall be such that cross-talk and unnecessary coupling between circuits cannot result in conditions of operation which are beyond the values allowed for the specified performance characteristics. Adequate shielding and other means of isolation shall be provided as necessary to prevent the occurrence of significant changes in signal levels, waveforms, timing, tuning, or operating conditions with any combination of open access doors; withdrawn chassis, or with printed wiring extender boards (3.3.1.4) in use. Also, the positioning of wires or cables shall not affect the operating conditions or performance of the equipment.

<u>3.3.12 Adjustments</u>.- The DME equipment shall be designed such that all transponder, monitor and control adjustments essential for proper operation and maintenance (other than tuning of RF stages or where otherwise indicated herein) and all indications resulting therefrom shall be accessible locally via the FCPU to IOT interface (3.1.21) or remotely in accordance with paragraph 3.3.12.3 herein.

<u>3.3.12.1 Adjustment display</u>.- An IOT in local mode of operation connected to the FCPU terminal interface shall be capable of displaying all control settings. For purposes of making adjustments, parameters must be selectable in accordance with the Government prepared interface control document (ICD) which is to be provided as part of-the contract schedule. The ability to adjust a parameter setting in minimum steps consistent with individual parameter tolerances must be provided together with the ability to directly enter a parameter setting from the IOT terminal keyboard.

<u>3.3.12.2 Adjustment storage</u>.- Electronically entered control settings must be stored in non-volatile memory either immediately upon entry or at the conclusion of an adjustment/maintenance operation. Storing of control settings shall be automatic and

processing unit (FCPU) and the existing FA-9996/1 VOR single phase power supply cabinet which includes the FA-9996/1.1 battery charger power supply (BCPS), the FA-9996/1.2 power conditioner system (PCS) and the FA-9996/1.3 standby power inverter. The functional interface requirements shall be in accordance with the interface control document (ICD) provided by the Government as part of the contract schedule. External test equipment required to calibrate, maintain and troubleshoot the new DME equipment shall be limited to the FA-9996 test equipment (paragraph 3.3.19.4). The compatibility requirements, addressed in the Government furnished ICD include, but are not limited to, the following:

(a) Electrical interfaces - Cables, connectors and FCPU interfaces. FA-9996 test equipment. Existing communications protocols with the FCPU and input/output terminal maintenance equipment.

(b) Electrical signals - BCPS voltage and current requirements. Signal levels, connector/pin assignments, timing, and voltage levels. Power consumption requirements and capabilities.

(c) Mechanical interfaces - Drawer dimensions, cable lengths, wire size, connectors, etc.

To ensure that this requirement is met after contract award, the Government will make available to the contractor a complete set of FA-9996 VOR/DME equipment (without antennas), including the remote monitor and control equipment, together with all instruction manuals. The contractor shall include in the Master Test Plan (MTP) of paragraph 4.1.4 the detailed procedures to be followed to demonstrate to the satisfaction of the Government that the equipment to be furnished complies in all respects with the compatibility requirements cited herein.

<u>3.4.3 DME remote monitoring subsystems (RMS) requirements</u>.- The DME RMS consists of the various sensors, microcomputers, built-in test equipment (BITE) and microprocessor controlled equipment necessary to locally and remotely monitor, control; record and certify proper operation of the DME equipment to be furnished under this specification. It includes the VOR FCPU to DME interface and the embedded sensors required for sampling signals from the DME equipment units. The exact FCPU to DME interface shall be in accordance with the ICD requirements provided by the Government as part of the contract schedule.

<u>3.4.3.1 DME RMS functions</u>.- The DME RMS shall provide the following functions:

(a) Monitor each of the minimum set ofperformance parameters required to determine the operational status of the DME equipment units. The monitor data shall be accumulated on a periodic basis; all monitor data and alarm data shall be-collected and

processing unit (FCPU) and the existing FA-9996/1 VOR single phase power supply cabinet which includes the FA-9996/1.1 battery charger power supply (BCPS), the FA-9996/1.2 power conditioner system (PCS) and the FA-9996/1.3 standby power inverter. The functional interface requirements shall be in accordance with the interface control document (ICD) provided by the Government as part of the contract schedule. External test equipment required to calibrate, maintain and troubleshoot the new DME equipment shall be limited to the FA-9996 test equipment (paragraph 3.3.19.4). The compatibility requirements, addressed in the Government furnished ICD include, but are not limited to, the following:

(a) Electrical interfaces - Cables, connectors and FCPU interfaces. FA-9996 test equipment. Existing communications protocols with the FCPU and input/output terminal maintenance equipment.

(b) Electrical signals - BCPS voltage and current requirements. Signal levels, connector/pin assignments, timing, and voltage levels. Power consumption requirements and capabilities.

(c) Mechanical interfaces - Drawer dimensions, cable lengths, wire size, connectors, etc.

To ensure that this requirement is met after contract award, the Government will make available to the contractor a complete set of FA-9996 VOR/DME equipment (without antennas), including the remote monitor and control equipment, together with all instruction manuals. The contractor shall include in the Master Test Plan (MTP) of paragraph 4.1.4 the detailed procedures to be followed to demonstrate to the satisfaction of the Government that the equipment to be furnished complies in all respects with the compatibility requirements cited herein.

<u>3.4.3 DME remote monitoring subsystems (RMS) requirements</u>.- The DME RMS consists of the various sensors, microcomputers, built-in test equipment (BITE) and microprocessor controlled equipment necessary to locally and remotely monitor, control; record and certify proper operation of the DME equipment to be furnished under this specification. It includes the VOR FCPU to DME interface and the embedded sensors required for sampling signals from the DME equipment units. The exact FCPU to DME interface shall be in accordance with the ICD requirements provided by the Government as part of the contract schedule.

<u>3.4.3.1 DME RMS functions</u>.- The DME RMS shall provide the following functions:

(a) Monitor each of the minimum set ofperformance parameters required to determine the operational status of the DME equipment units. The monitor data shall be accumulated on a periodic basis; all monitor data and alarm data shall be-collected and

processing unit (FCPU) and the existing FA-9996/1 VOR single phase power supply cabinet which includes the FA-9996/1.1 battery charger power supply (BCPS), the FA-9996/1.2 power conditioner system (PCS) and the FA-9996/1.3 standby power inverter. The functional interface requirements shall be in accordance with the interface control document (ICD) provided by the Government as part of the contract schedule. External test equipment required to calibrate, maintain and troubleshoot the new DME equipment shall be limited to the FA-9996 test equipment (paragraph 3.3.19.4). The compatibility requirements, addressed in the Government furnished ICD include, but are not limited to, the following:

(a) Electrical interfaces - Cables, connectors and FCPU interfaces. FA-9996 test equipment. Existing communications protocols with the FCPU and input/output terminal maintenance equipment.

(b) Electrical signals - BCPS voltage and current requirements. Signal levels, connector/pin assignments, timing, and voltage levels. Power consumption requirements and capabilities.

(c) Mechanical interfaces - Drawer dimensions, cable lengths, wire size, connectors, etc.

To ensure that this requirement is met after contract award, the Government will make available to the contractor a complete set of FA-9996 VOR/DME equipment (without antennas), including the remote monitor and control equipment, together with all instruction manuals. The contractor shall include in the Master Test Plan (MTP) of paragraph 4.1.4 the detailed procedures to be followed to demonstrate to the satisfaction of the Government that the equipment to be furnished complies in all respects with the compatibility requirements cited herein.

3.4.3 DME remote monitoring subsystems (RMS) requirements.- The DME RMS consists of the various sensors, microcomputers, built-in test equipment (BITE) and microprocessor controlled equipment necessary to locally and remotely monitor, control; record and certify proper operation of the DME equipment to be furnished under this specification. It includes the VOR FCPU to DME interface and the embedded sensors required for sampling signals from the DME equipment units. The exact FCPU to DME interface shall be in accordance with the ICD requirements provided by the Government as part of the contract schedule.

3.4.3.1 DME RMS functions.- The DME RMS shall provide the following functions:

(a) Monitor each of the minimum set ofperformance parameters required to determine the operational status of the DME equipment units. The monitor data shall be accumulated on a periodic basis; all monitor data and alarm data shall be-collected and

processing unit (FCPU) and the existing FA-9996/1 VOR single phase power supply cabinet which includes the FA-9996/1.1 battery charger power supply (BCPS), the FA-9996/1.2 power conditioner system (PCS) and the FA-9996/1.3 standby power inverter. The functional interface requirements shall be in accordance with the interface control document (ICD) provided by the Government as part of the contract schedule. External test equipment required to calibrate, maintain and troubleshoot the new DME equipment shall be limited to the FA-9996 test equipment (paragraph 3.3.19.4). The compatibility requirements, addressed in the Government furnished ICD include, but are not limited to, the following:

(a) Electrical interfaces - Cables, connectors and FCPU interfaces. FA-9996 test equipment. Existing communications protocols with the FCPU and input/output terminal maintenance equipment.

(b) Electrical signals - BCPS voltage and current requirements. Signal levels, connector/pin assignments, timing, and voltage levels. Power consumption requirements and capabilities.

(c) Mechanical interfaces - Drawer dimensions, cable lengths, wire size, connectors, etc.

To ensure that this requirement is met after contract award, the Government will make available to the contractor a complete set of FA-9996 VOR/DME equipment (without antennas), including the remote monitor and control equipment, together with all instruction manuals. The contractor shall include in the Master Test Plan (MTP) of paragraph 4.1.4 the detailed procedures to be followed to demonstrate to the satisfaction of the Government that the equipment to be furnished complies in all respects with the compatibility requirements cited herein.

<u>3.4.3 DME remote monitoring subsystems (RMS) requirements</u>.- The DME RMS consists of the various sensors, microcomputers, built-in test equipment (BITE) and microprocessor controlled equipment necessary to locally and remotely monitor, control, record and certify proper operation of the DME equipment to be furnished under this specification. It includes the VOR FCPU to DME interface and the embedded sensors required for sampling signals from the DME equipment units. The exact FCPU to DME interface shall be in accordance with the ICD requirements provided by the Government as part of the contract schedule.

<u>3.4.3.1 DME RMS functions</u>.- The DME RMS shall provide the following functions:

(a) Monitor each of the minimum set ofperformance parameters required to determine the operational status of the DME equipment units. The monitor data shall be accumulated on a periodic basis; all monitor data and alarm data shall be-collected and

Service	Certification Parameters	Standards	Operating Tolerance %Limits
Coverage	Receiver Sensitivity	-94 dBm	-91 dBm
	Monitor Rcvr/ Sensitivity Alarm	-91 dBm	±1.0 dBm
	Reply Pulse Spacing	12 us (X mode)	±0.2 us
	Monitor Reply Pulse Spacing Alarm	11.2 - 12.8 us	±0.2 us
	Receiver Decoder .	11 - 13 us	11 - 13 us
	Peak Power DME	1.0 kw	500w to 1250w
	Monitor Peak	500 w	±5%
	Peak Power, -Terminal DME	100 watts	50w to 125w
	Monitor Peak, Terminal DME	50 watts	±5%
Distance Accuracy	Reply Delay	50 us (49.3 us. Mountain Top)	±0.2 us ±0.2 us
	Monitor Reply Delay Alarm	±0.6 us	±0.2 us
	Reply Efficiency	98%	70%
	Count Squitter	1350 ± 50	±100
	Low Alarm Limit	850 ± 50	850 ±100
	High Alarm Limit	None	None
Identification	Monitor Ident Alarm	Morse Code established at 1350 Hz ±5 Hz	±10 Hz

Service	Certification Parameters	Standards	Operating Tolerance Limits
Coverage	Receiver Sensitivity	-94 dBm	-91 dBm
	Monitor Rcvr/ Sensitivity Alarm	-91 dBm	±1.0 dBm
	Reply Pulse Spacing	12*us (X mode)	±0.2 us
	Monitor Reply Pulse Spacing Alarm	11.2 - 12.8 us	±0.2 us
	Receiver Decoder	11 - 13 us	11 - 13 us
	Peak Power DME	1.0 kw	500w to 1250w
	Monitor Peak	500 w	±5%
	Peak Power, Terminal DME	100 watts	50w to 125w
	Monitor Peak, Terminal DME	50 watts	±5%
Distance Accuracy	Reply Delay	50 us (49.3 us. Mountain Top)	±0.2 us ±0.2 us
	Monitor Reply Delay Alarm	±0.6 us	±0.2 us
	Reply Efficiency	98%	70%
	Count Squitter Low Alarm Limit High Alarm Limit	1350 ± 50 850 ± 50 None	±100 850 ±100 None
Identification	Monitor Ident Alarm	Morse Code established at 1350 Hz ±5 Hz	±10 Hz

Service	Certification Parameters	Standards	Operating Tolerance %Limits
Coverage	Receiver Sensitivity	-94 dBm	-91 dBm
	Monitor Rcvr/ Sensitivity Alarm	-91 dBm	±1.0 dBm
	Reply Pulse Spacing	12 us (X mode)	±0.22 us
	Monitor Reply Pulse Spacing Alarm	11.2 - 12.8 us	±0.2 us
	Receiver Decoder .	11 - 13 us	11 - 13 us
	Peak Power DME	1.0 kw	500w to 1250W
	Monitor Peak	500 w	±5%
	Peak Power, -Terminal DME	100 watts	50w to 125w
	Monitor Peak, Terminal DME	50 watts	±5%
Distance Accuracy	Reply Delay	50 us (49.3 us. Mountain Top)	±0.2 us ±0.2 us
	Monitor Reply Delay Alarm	±0.6 us	±0.2 us
	Reply Efficiency	98%	70%
	Count Squitter Low Alarm Limit High Alarm Limit	1350 ± 50 850 ± 50 None	±100 850 ±100 None
Identification	Monitor Ident Alarm	Morse Code established at 1350 Hz ±5 Hz	±10 Hz -

Service	Certification Parameters	Standards	Operating Tolerance %Limits
Coverage	Receiver Sensitivity	-94 dBm	-91 dBm
	Monitor Rcvr/ Sensitivity Alarm	-91 dBm	±1.0 dBm
	Reply Pulse Spacing	12* us (X mode)	±0.2 us
	Monitor Reply Pulse Spacing Alarm	11.2 - 12.8 us	±0.2 us
	Receiver Decoder	11 - 13 us	11 - 13 us
	Peak Power DME	1.0 kw	500w to 1250W
	Monitor Peak	500 w	±5%
	Peak Power, Terminal DME	100 watts	50w to 125w
	Monitor Peak, Terminal DME	50 watts	±5%
Distance Accuracy	Reply Delay	50 us (49.3 us. Mountain Top)	±0.2 us ±0.2 us
	Monitor Reply Delay Alarm	±0.6 us	±0.2 us
	Reply Efficiency	98%	70%
	Count Squitter	1350 ± 50	±100
	Low Alarm Limit	850 ± 50	850 ±100
	High Alarm Limit	None	None
Identification	Monitor Ident Alarm	Morse Code established at 1350 Hz ±5 Hz	±10 Hz

or trailing edge of the second pulse of the direct path pulse pair, shall not affect the time of decoding of the direct pulse pair by an amount in excess of 0.15 microsecond. Neither shall the reply efficiency be reduced by more than 10 percent from that measured in the absence of the echo pulse. These requirements shall be met when the RF input signal level of the direct path pulse pair has any level from 10 dB above threshold triggering level to an absolute level of -10 dBm and the echo pulse has any level up to the level of the direct pulse pair and for all direct pulse pair spacings of 3.4.4.3.2. For test purposes the leading edge of an 8.0 microsecond wide rectangular echo pulse shall be located between the 90 percent and 50 percent amplitude points on the trailing edge of the first pulse of the direct path interrogation signal. The echo pulse need not be phase coherent with the direct path interrogation signal.

<u>3.4.4.3.5.2 Long distance echos</u>.- A separate echo suppression circuit shall be provided in order to prevent the generation of multiple replies to aircraft interrogations having echos which are delayed with respect to the direct path signal in excess of receiver dead time setting. The echo suppression circuit shall be triggered by the decoding of a direct signal pulse pair whenever the level of the pulses exceeds a preestablished level. Such triggering shall result in the generation of a receiver desensitizing pulse starting at the time of pulse decoding. The degree of receiver desensitation shall be to a level of 3.0 +3 dB above the level of the direct path signal and shall hold over the entire duration of the echo suppression pulse, unless retriggered by a signal stronger by 0 to 6 dB than the direct path signal, and over a range of input signals from 10 dB above threshold triggering level to -15 dBm. Individual controls shall be provided for:

(a) Adjustment of the triggering level to any level between -80 dBm and -10dBm (the latter effectively disabling the echo suppression feature). The triggering level will nominally be set at -70 dBm.

(b) Adjustment of the duration of the desensitization over the range of 50 through 350 microseconds. The duration of desensitization will nominally be set at 150 microseconds (±10 microseconds).-

All settings shall be adjustable via the FCPU to DME interface.

<u>3.4.4.3.6 Station DME traffic load monitoring</u>.- Outputs shall be provided for local and remote monitoring of:

(a) The total number of decoded pulse pairs per second (total traffic).

(b) The number of echo suppression desensitization pulses (3.4.4.3.5) triggered per second (local or strong signal traffic).

or trailing edge of the second pulse of the direct path pulse pair, shall not affect the time of decoding of the direct pulse pair by an amount in excess of 0.15 microsecond. Neither shall the reply efficiency be reduced by more than 10 percent from that measured in the absence of the echo pulse. These requirements shall be met when the RF input signal level of the direct path pulse pair has any level from 10 dB above threshold triggering level to an absolute level of -10 dBm and the echo pulse has any level up to the level of the direct pulse pair and for all direct pulse pair spacings of 3.4.4.3.2. For test purposes the leading edge of an 8.0 microsecond wide rectangular echo pulse shall be located between the 90 percent and 50 percent amplitude points on the trailing edge of the first pulse of the direct path interrogation signal. The echo pulse need not be phase coherent with the direct path interrogation signal.

<u>3.4.4.3.5.2 Long distance echos.</u>- A separate echo suppression circuit shall be provided in order to prevent the generation of multiple replies to aircraft interrogations having echos which are delayed with respect to the direct path signal in excess of receiver dead time setting. The echo suppression circuit shall be triggered by the decoding of a direct signal pulse pair whenever the level of the pulses exceeds a preestablished level. Such triggering shall result in the generation of a receiver desensitizing pulse starting at the time of pulse decoding. The degree of receiver desensitation shall be to a level of 3.0 +3 dB above the level of the direct path signal and shall hold over the entire duration of the echo suppression pulse, unless retriggered by a signal stronger by 0 to 6 dB than the direct path signal, and over a range of input signals from 10 dB above threshold triggering level to -15 dBm. Individual controls shall be provided for:

(a) Adjustment of the triggering level to any level between -80 dBm and -10dBm (the latter effectively disabling the echo suppression feature). The triggering level will nominally be set at -70 dBm.

(b) Adjustment of the duration of the desensitization over the range of 50 through 350 microseconds. The duration of desensitization will nominally be set at 150 microseconds (±10 microseconds).-

All settings shall be adjustable via the FCPU to DME interface.

<u>3.4.4.3.6 Station DME traffic load monitoring.</u>- Outputs shall be provided for local and remote monitoring of:

(a) The total number of decoded pulse pairs per second (total traffic).

(b) The number of echo suppression desensitization pulses (3.4.4.3.5) triggered per second (local or strong signal traffic).

or trailing edge of the second pulse of the direct path pulse pair, shall not affect the time of decoding of the direct pulse pair by an amount in excess of 0.15 microsecond. Neither shall the reply efficiency be reduced by more than 10 percent from that measured in the absence of the echo pulse. These requirements shall be met when the RF input signal level of the direct path pulse pair has any level from 10 dB above threshold triggering level to an absolute level of -10 dBm and the echo pulse has any level up to the level of the direct pulse pair and for all direct pulse pair spacings of 3.4.4.3.2. For test purposes the leading edge of an 8.0 microsecond wide rectangular echo pulse shall be located between the 90 percent and 50 percent amplitude points on the trailing edge of the first pulse of the direct path interrogation signal. The echo pulse need not be phase coherent with the direct path interrogation signal.

<u>3.4.4.3.5.2 Long distance echos</u>.- A separate echo suppression circuit shall be provided in order to prevent the generation of multiple replies to aircraft interrogations having echos which are delayed with respect to the direct path signal in excess of receiver dead time setting. The echo suppression circuit shall be triggered by the decoding of a direct signal pulse pair whenever the level of the pulses exceeds a preestablished level. Such triggering shall result in the generation of a receiver desensitizing pulse starting at the time of pulse decoding. The degree of receiver desensitation shall be to a level of 3.0 +3 dB above the level of the direct path signal and shall hold over the entire duration of the echo suppression pulse, unless retriggered by a signal stronger by 0 to 6 dB than the direct path signal, and over a range of input signals from 10 dB above threshold triggering level to -15 dBm. Individual controls shall be provided for:

(a) Adjustment of the triggering level to any level between -80 dBm and -10dBm (the latter effectively disabling the echo suppression feature). The triggering level will nominally be set at -70 dBm.

(b) Adjustment of the duration of the desensitization over the range of 50 through 350 microseconds. The duration of desensitization will nominally be set at 150 microseconds (±10 microseconds).-

All settings shall be adjustable via the FCPU to DME interface.

<u>3.4.4.3.6 Station DME traffic load monitoring</u>.- Outputs shall be provided for local and remote monitoring of:

(a) The total number of decoded pulse pairs per second (total traffic).

(b) The number of echo suppression desensitization pulses (3.4.4.3.5) triggered per second (local or strong signal traffic).

or trailing edge of the second pulse of the direct path pulse pair, shall not affect the time of decoding of the direct pulse pair by an amount in excess of 0.15 microsecond. Neither shall the reply efficiency be reduced by more than 10 percent from that measured in the absence of the echo pulse. These requirements shall be met when the RF input signal level of the direct path pulse pair has any level from 10 dB above threshold triggering level to an absolute level of -10 dBm and the echo pulse has any level up to the level of the direct pulse pair and for all direct pulse pair spacings of 3.4.4.3.2. For test purposes the leading edge of an 8.0 microsecond wide rectangular echo pulse shall be located between the 90 percent and 50 percent amplitude points on the trailing edge of the first pulse of the direct path interrogation signal. The echo pulse need not be phase coherent with the direct path interrogation signal.

<u>3.4.4.3.5.2 Long distance echos</u>.- A separate echo suppression circuit shall be provided in order to prevent the generation of multiple replies to aircraft interrogations having echos which are delayed with respect to the direct path signal in excess of receiver dead time setting. The echo suppression circuit shall be triggered by the decoding of a direct signal pulse pair whenever the level of the pulses exceeds a preestablished level. Such triggering shall result in the generation of a receiver desensitizing pulse starting at the time of pulse decoding. The degree of receiver desensitation shall be to a level of 3.0 ±3 dB above the level of the direct path signal and shall hold over the entire duration of the echo suppression pulse, unless retriggered by a signal stronger by 0 to 6 dB than the direct path signal, and over a range of input signals from 10 dB above threshold triggering level to -15 dBm. Individual controls shall be provided for:

(a) Adjustment of the triggering level to any level between -80 dBm and -10dBm (the latter effectively disabling the echo suppression feature). The triggering level will nominally be set at -70 dBm.

(b) Adjustment of the duration of the desensitization over the range of 50 through 350 microseconds. The duration of desensitization will nominally be set at 150 microseconds (±10 microseconds).-

All settings shall be adjustable via the FCPU to DME interface.

<u>3.4.4.3.6 Station DME traffic load monitoring</u>.- Outputs shall be provided for local and remote monitoring of:

(a) The total number of decoded pulse pairs per second (total traffic).

(b) The number of echo suppression desensitization pulses (3.4.4.3.5) triggered per second (local or strong signal traffic).

The receiver sensitivity requirement of paragraph 3.4.4.3.7.1 shall be met when the receiver squitter rate is controlled to provide decoded receiver noise pulses at a rate no greater than 10 per second. It shall be possible, by setting the receiver gain control to minimum position, to reduce the receiver threshold sensitivity to -60 dBm or lower, and once set within its range. shall be stable within ±1.0 dB of that setting.

3.4.4.3.10.1 Priority of reply pulses.- Whenever triggers due to squitter occur prior to triggers due to decodes at the input of the priority gate circuits, the squitter triggers shall be inhibited for all spacings between triggers of 25 microseconds and less in "X" channel and 10 microseconds or less in "Y" channel. The above operation applies for reply delay settings of 50 microseconds and greater. Whenever triggers due to decodes occur prior to squitter triggers, the squitter triggers will be inhibited for all spacings of 25 microseconds and less for "X" channel and 65 microseconds and less for "Y" channel.

3.4.4.3.11 Pulse rate control.- The composite signal at the video output terminal of the priority gate circuitry (paragraph 3.4.4.3.10.1) shall consist of decoded interrogation pulses or squitter pulses, or both, in accordance with the following and paragraph 3.4.4.3.12. The squitter pulses from the separate squitter generator shall be automatically controlled in number as a function of interrogation signal loading (3.4.4.3.11.1). The output pulse spacing distribution of the separate squitter generator shall be essentially exponential with a minimum spacing of 60 microseconds. When the squitter pulse generator is providing output pulse pairs at the rate of 1350 +150 (in the absence of decoded interrogation or receiver noise pulses) the output pulse pair spacing distribution shall be non-uniform with no pulse pairs spaced less than 60 microseconds apart.

3.4.4.3.11.1 Effect of traffic loading.- For all interrogation rates resulting in zero to 1500 receiver decodes per second, the squitter pulse generator shall produce not more than 1500-N pulses per second nor less than 1200-N pulses per second, where N is the number of receiver decodes. For all interrogation rates resulting in excess of 1500 receiver decodes per second, the squitter pulse generator shall produce no output.

3.4.4.3.12 Automatic gain reduction (AGR).- Under interrogation overload conditions in which the number of replies to interrogation signals tends to exceed 1350 pulse pairs per second, the receiver sensitivity shall be automatically reduced by the minimum amount necessary to maintain the transponder output pulse rate of 2700 (+150) pulse pairs per second. The available gain reduction shall not be less than 35 dB. The AGR circuit shall be adjustable (for future use.. when increased traffic handling capacity may be required) to operate at any nominal level up to a transponder output pulse rate of 5000 (±150) pps.

3.4.4.3.12.1 Interrogation overload signal.- At all times that AGR is in operation, a signal shall be provided to the monitors in order to prevent receiver sensitivity alarms at times when the

The receiver sensitivity requirement of paragraph 3.4.4.3.7.1 shall be met when the receiver squitter rate is controlled to provide decoded receiver noise pulses at a rate no greater than 10 per second. It shall be possible, by setting the receiver gain control to minimum position, to reduce the receiver threshold sensitivity to -60 dBm or lower, and once set within its range. shall be stable within ±1.0 dB of that setting.

3.4.4.3.10.1 Priority of reply pulses.- Whenever triggers due to squitter occur prior to triggers due to decodes at the input of the priority gate circuits, the squitter triggers shall be inhibited for all spacings between triggers of 25 microseconds and less in "X" channel and 10 microseconds or less in "Y" channel. The above operation applies for reply delay settings of 50 microseconds and greater. Whenever triggers due to decodes occur prior to squitter triggers, the squitter triggers will be inhibited for all spacings of 25 microseconds and less for "X" channel and 65 microseconds and less for "Y" channel.

3.4.4.3.11 Pulse rate control.- The composite signal at the video output terminal of the priority gate circuitry (paragraph 3.4.4.3.10.1) shall consist of decoded interrogation pulses or squitter pulses, or both, in accordance with the following and paragraph 3.4.4.3.12. The squitter pulses from the separate squitter generator shall be automatically controlled in number as a function of interrogation signal loading (3.4.4.3.11.1). The output pulse spacing distribution of the separate squitter generator shall be essentially exponential with a minimum spacing of 60 microseconds. When the squitter pulse generator is providing output pulse pairs at the rate of 1350 +150 (in the absence of decoded interrogation or receiver noise pulses) the output pulse pair spacing distribution shall be non-uniform with no pulse pairs spaced less than 60 microseconds apart.

3.4.4.3.11.1 Effect of traffic loading.- For all interrogation rates resulting in zero to 1500 receiver decodes per second, the squitter pulse generator shall produce not more than 1500-N pulses per second nor less than 1200-N pulses per second, where N is the number of receiver decodes. For all interrogation rates resulting in excess of 1500 receiver decodes per second, the squitter pulse generator shall produce no output.

3.4.4.3.12 Automatic gain reduction (AGR).- Under interrogation overload conditions in which the number of replies to interrogation signals tends to exceed 1350 pulse pairs per second, the receiver sensitivity shall be automatically reduced by the minimum amount necessary to maintain the transponder output pulse rate of 2700 (+150) pulse pairs per second. The available gain reduction shall not be less than 35 dB. The AGR circuit shall be adjustable (for future use.. .when increased traffic handling capacity may be required) to operate at any nominal level up to a transponder output pulse rate of 5000 (±150) pps.

3.4.4.3.12.1 Interrogation overload signal.- At all times that AGR is in operation, a signal shall be provided to the monitors in order to prevent receiver sensitivity alarms at times when the

The receiver sensitivity requirement of paragraph 3.4.4.3.7.1 shall be met when the receiver squitter rate is controlled to provide decoded receiver noise pulses at a rate no greater than 10 per second. It shall be possible, by setting the receiver gain control to minimum position, to reduce the receiver threshold sensitivity to -60 dBm or lower, and once set within its range. shall be stable within ±1.0 dB of that setting.

3.4.4.3.10.1 Priority of reply pulses.- Whenever triggers due to squitter occur prior to triggers due to decodes at the input of the priority gate circuits, the squitter triggers shall be inhibited for all spacings between triggers of 25 microseconds and less in "X" channel and 10 microseconds or less in "Y" channel. The above operation applies for reply delay settings of 50 microseconds and greater. Whenever triggers due to decodes occur prior to squitter triggers, the squitter triggers will be inhibited for all spacings of 25 microseconds and less for "X" channel and 65 microseconds and less for "Y" channel.

3.4.4.3.11 Pulse rate control.- The composite signal at the video output terminal of the priority gate circuitry (paragraph 3.4.4.3.10.1) shall consist of decoded interrogation pulses or squitter pulses, or both, in accordance with the following and paragraph 3.4.4.3.12. The squitter pulses from the separate squitter generator shall be automatically controlled in number as a function of interrogation signal loading (3.4.4.3.11.1). The output pulse spacing distribution of the separate squitter generator shall be essentially exponential with a minimum spacing of 60 microseconds. When the squitter pulse generator is providing output pulse pairs at the rate of 1350 +150 (in the absence of decoded interrogation or receiver noise pulses) the output pulse pair spacing distribution shall be non-uniform with no pulse pairs spaced less than 60 microseconds apart.

3.4.4.3.11.1 Effect of traffic loading.- For all interrogation rates resulting in zero to 1500 receiver decodes per second, the squitter pulse generator shall produce not more than 1500-N pulses per second nor less than 1200-N pulses per second, where N is the number of receiver decodes. For all interrogation rates resulting in excess of 1500 receiver decodes per second, the squitter pulse generator shall produce no output.

3.4.4.3.12 Automatic gain reduction (AGR).- Under interrogation overload conditions in which the number of replies to interrogation signals tends to exceed 1350 pulse pairs per second, the receiver sensitivity shall be automatically reduced by the minimum amount necessary to maintain the transponder output pulse rate of 2700 (+150) pulse pairs per second. The available gain reduction shall not be less than 35 dB. The AGR circuit shall be adjustable (for future use.. when increased traffic handling capacity may be required) to operate at any nominal level up to a transponder output pulse rate of 5000 (±150) pps.

3.4.4.3.12.1 Interrogation overload signal.- At all times that AGR is in operation, a signal shall be provided to the monitors in order to prevent receiver sensitivity alarms at times when the

3.4.4.6.1.1.3 Pulse duration.- The pulse duration shall be 3.5 (±0.5) microseconds.

3.4.4.6.1.1.4 Pulse decay time.- The decay time shall be 2.5 (+0.5, -1.0) microseconds.

3.4.4.6.1.2 Power output.- The power output at the peak of each pulse shall not be less than a level of 1000 watts as measured at the output of the equipment cabinet. The DME shall also meet all specification requirements when the power output, as measured at the output of the equipment cabinet, is setup for 100 watt operation.

3.4.4.6.1.3 Pulse power variation.- The difference in power level at the peak of constituent pulses of any pulse pair shall not exceed 1 dB. Additional amplitude modulation of the output pulse train shall not exceed 5 percent.

3.4.4.6.1.4 RF output control.- Means shall be provided to permit continuous adjustment of the RF output power in steps of .25 dB or less from a preset level of 1000 watts or from a preset level of 100 watts over the range of 0 to -6 dB, respectively. It shall also be possible to enter the desired output level within the range of 1000 watts to 250 watts or within the range of 100 watts to 25 watts directly from the FCPU to DME interface. All transponder output signal requirements of paragraph 3.4.4.6.1.1 through 3.4.4.6.1.4 shall be met throughout the specified range of power output levels without the need for readjustment of any other controls.

3.4.4.6.1.5 Tuning and spurious output.- The tuning of all RF stages shall be straightforward and free of ambiguities. There shall be no spurious output or parasitic oscillations in any stage for any combination of tuning control positions with either normal or subnormal excitation conditions.

3.4.4.6.1.6 RF pulse signal spectrum.- The pulse signal spectrum of the transmitter output signal shall be such that the power contained in a 0.50 MHz band centered on frequencies 0.80 MHz above and below the nominal reply frequency is in each case at a level which is not less than 47 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. The power contained in a 0.50 MHz band centered on frequencies 2.0 MHz above and below the nominal reply frequency shall in each case be at a level which is not less than 67 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. All other like bands of the spectrum which are further removed from the reply frequency shall have lower levels of power therein than the adjacent band nearer the reply frequency. (The above dB ratios shall apply when the transponder is delivering 1000 watts of peak power. For any higher peak power output, the minimum dB ratios shall be increased proportionately, e.g., for an output power of 1250 watts the dB ratios shall be 48 and 68 dB in lieu of 47 dB and 67dB. Conversely, for the reduced power levels specified in paragraph 3.4.4.6.1.4 the dB ratios shall be reduced proportionately.)

<u>3.4.4.6.1.1.3 Pulse duration</u>.- The pulse duration shall be 3.5 (±0.5) microseconds.

<u>3.4.4.6.1.1.4 Pulse decay time</u>.- The decay time shall be 2.5 (+0.5, -1.0) microseconds.

<u>3.4.4.6.1.2 Power output</u>.- The power output at the peak of each pulse shall not be less than a level of 1000 watts as measured at the output of the equipment cabinet. The DME shall also meet all specification requirements when the power output, as measured at the output of the equipment cabinet, is setup for 100 watt operation.

<u>3.4.4.6.1.3 Pulse power variation</u>.- The difference in power level at the peak of constituent pulses of any pulse pair shall not exceed 1 dB. Additional amplitude modulation of the output pulse train shall not exceed 5 percent.

<u>3.4.4.6.1.4 RF output control</u>.- Means shall be provided to permit continuous adjustment of the RF output power in steps of .25 dB or less from a preset level of 1000 watts or from a preset level of 100 watts over the range of 0 to -6 dB, respectively. It shall also be possible to enter the desired output level within the range of 1000 watts to 250 watts or within the range of 100 watts to 25 watts directly from the FCPU to DME interface. All transponder output signal requirements of paragraph 3.4.4.6.1.1 through 3.4.4.6.1.4 shall be met throughout the specified range of power output levels without the need for readjustment of any other controls.

<u>3.4.4.6.1.5 Tuning and spurious output</u>.- The tuning of all RF stages shall be straightforward and free of ambiguities. There shall be no spurious output or parasitic oscillations in any stage for any combination of tuning control positions with either normal or subnormal excitation conditions.

<u>3.4.4.6.1.6 RF pulse signal spectrum</u>.- The pulse signal spectrum of the transmitter output signal shall be such that the power contained in a 0.50 MHz band centered on frequencies 0.80 MHz above and below the nominal reply frequency is in each case at a level which is not less than 47 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. The power contained in a 0.50 MHz band centered on frequencies 2.0 MHz above and below the nominal reply frequency shall in each case be at a level which is not less than 67 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. All other like bands of the spectrum which are further removed from the reply frequency shall have lower levels of power therein than the adjacent band nearer the reply frequency. (The above dB ratios shall apply when the transponder is delivering 1000 watts of peak power. For any higher peak power output, the minimum dB ratios shall be increased proportionately, e.g., for an output power of 1250 watts the dB ratios shall be 48 and 68 dB in lieu of 47 dB and 67dB. Conversely, for the reduced power levels specified in paragraph 3.4.4.6.1.4 the dB ratios shall be reduced proportionately.)

3.4.4.6.1.1.3 Pulse duration.- The pulse duration shall be 3.5 (±0.5) microseconds.

3.4.4.6.1.1.4 Pulse decay time.- The decay time shall be 2.5 (+0.5, -1.0) microseconds.

3.4.4.6.1.2 Power output.- The power output at the peak of each pulse shall not be less than a level of 1000 watts as measured at the output of the equipment cabinet. The DME shall also meet all specification requirements when the power output, as measured at the output of the equipment cabinet, is setup for 100 watt operation.

3.4.4.6.1.3 Pulse power variation.- The difference in power level at the peak of constituent pulses of any pulse pair shall not exceed 1 dB. Additional amplitude modulation of the output pulse train shall not exceed 5 percent.

3.4.4.6.1.4 RF output control.- Means shall be provided to permit continuous adjustment of the RF output power in steps of .25 dB or less from a preset level of 1000 watts or from a preset level of 100 watts over the range of 0 to -6 dB, respectively. It shall also be possible to enter the desired output level within the range of 1000 watts to 250 watts or within the range of 100 watts to 25 watts directly from the FCPU to DME interface. All transponder output signal requirements of paragraph 3.4.4.6.1.1 through 3.4.4.6.1.4 shall be met throughout the specified range of power output levels without the need for readjustment of any other controls.

3.4.4.6.1.5 Tuning and spurious output.- The tuning of all RF stages shall be straightforward and free of ambiguities. There shall be no spurious output or parasitic oscillations in any stage for any combination of tuning control positions with either normal or subnormal excitation conditions.

3.4.4.6.1.6 RF pulse signal spectrum.- The pulse signal spectrum of the transmitter output signal shall be such that the power contained in a 0.50 MHz band centered on frequencies 0.80 MHz above and below the nominal reply frequency is in each case at a level which is not less than 47 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. The power contained in a 0.50 MHz band centered on frequencies 2.0 MHz above and below the nominal reply frequency shall in each case be at a level which is not less than 67 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. All other like bands of the spectrum which are further removed from the reply frequency shall have lower levels of power therein than the adjacent band nearer the reply frequency. (The above dB ratios shall apply when the transponder is delivering 1000 watts of peak power. For any higher peak power output, the minimum dB ratios shall be increased proportionately, e.g., for an output power of 1250 watts the dB ratios shall be 48 and 68 dB in lieu of 47 dB and 67dB. Conversely, for the reduced power levels specified in paragraph 3.4.4.6.1.4 the dB ratios shall be reduced proportionately.)

3.4.4.6.1.1.3 Pulse duration.- The pulse duration shall be 3.5 (±0.5) microseconds.

3.4.4.6.1.1.4 Pulse decay time.- The decay time shall be 2.5 (+0.5, -1.0) microseconds.

3.4.4.6.1.2 Power output.- The power output at the peak of each pulse shall not be less than a level of 1000 watts as measured at the output of the equipment cabinet. The DME shall also meet all specification requirements when the power output, as measured at the output of the equipment cabinet, is setup for 100 watt operation.

3.4.4.6.1.3 Pulse power variation.- The difference in power level at the peak of constituent pulses of any pulse pair shall not exceed 1 dB. Additional amplitude modulation of the output pulse train shall not exceed 5 percent.

3.4.4.6.1.4 RF output control.- Means shall be provided to permit continuous adjustment of the RF output power in steps of .25 dB or less from a preset level of 1000 watts or from a preset level of 100 watts over the range of 0 to -6 dB, respectively. It shall also be possible to enter the desired output level within the range of 1000 watts to 250 watts or within the range of 100 watts to 25 watts directly from the FCPU to DME interface. All transponder output signal requirements of paragraph 3.4.4.6.1.1 through 3.4.4.6.1.4 shall be met throughout the specified range of power output levels without the need for readjustment of any other controls.

3.4.4.6.1.5 Tuning and spurious output.- The tuning of all RF stages shall be straightforward and free of ambiguities. There shall be no spurious output or parasitic oscillations in any stage for any combination of tuning control positions with either normal or subnormal excitation conditions.

3.4.4.6.1.6 RF pulse signal spectrum.- The pulse signal spectrum of the transmitter output signal shall be such that the power contained in a 0.50 MHz band centered on frequencies 0.80 MHz above and below the nominal reply frequency is in each case at a level which is not less than 47 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. The power contained in a 0.50 MHz band centered on frequencies 2.0 MHz above and below the nominal reply frequency shall in each case be at a level which is not less than 67 dB below the power contained in a 0.50 MHz band centered on the nominal reply frequency. All other like bands of the spectrum which are further removed from the reply frequency shall have lower levels of power therein than the adjacent band nearer the reply frequency. (The above dB ratios shall apply when the transponder is delivering 1000 watts of peak power. For any higher peak power output, the minimum dB ratios shall be increased proportionately, e.g., for an output power of 1250 watts the dB ratios shall be 48 and 68 dB in lieu of 47 dB and 67dB. Conversely, for the reduced power levels specified in paragraph 3.4.4.6.1.4 the dB ratios shall be reduced proportionately.)

alarm) of redundant encoder circuitry, in the transponder (where so equipped), or in the shutdown of the DME (if this is the second alarm), as appropriate. (See paragraphs 3.1.20 and 3.3.18.)

(2) Alarm on either parameters (e) or (g) shall result in shutdown of 'the DME.

3.4.5.3.2 Key parameter detailed requirements.-

3.4.5.3.2.1 Reply delay monitor.- The reply delay monitor shall measure the position of reply pulses transmitted in response 'to the higher-level outputs of the interrogation signal generator (paragraph 3.4.5.4). The fault threshold point shall be reached whenever the reply delay (3.1.27) deviates from its nominal setting by ±0.6 (±0.2) microsecond and more. The performance of the reply delay monitor shall not be sensitive to the interrogation rate of the monitor signal generator nor to the percentage of replies to monitor interrogation for reply efficiencies as low as 50 percent. The reply delay monitor shall, however, provide a count of the number of replies to monitor interrogation and provide a measure of reply efficiency for remote maintenance monitoring purposes. False alarm data collection may be inhibited during identification for a period of time not to exceed 5 seconds.

3.4.5.3.2.2 Output pulse spacing monitor.- The output pulse spacing monitor shall measure the spacing of the transponder output pulse pairs. (3.4.4.4.2). The fault threshold shall be reached whenever the spacing deviates from the nominal value for the channel assigned (12.0 or 30.0 microseconds) by ±0.4 (±0.2) microsecond and more. False alarm data collection may be inhibited during identification for a period of time not to exceed 5 seconds.

3.4.5.3.2.3 Receiver sensitivity monitor.- The receiver sensitivity monitor shall measure the percentage of replies transmitted in response to the lower-level outputs of the interrogation signal generator (paragraph 3.4.5.4). The fault threshold level shall be adjustable between the limits of 50 to 70 percent. The adjustment shall either be continuous or in increments of not greater than 2.5 percent. Fault (and alarm) conditions shall be provided in accordance with the following.

(a) Within 15 seconds (90 percent confidence level) when the true reply efficiency is 10 percentage points below the threshold setting.

(b) Within 30 seconds (90 percent confidence level) when the true reply efficiency is 5 percentage points below the threshold setting.

(c) Within 30 seconds (50 percent confidence level) when the true reply efficiency is 2.5 percentage points below the threshold level.

alarm) of redundant encoder circuitry, in the transponder (where so equipped), or in the shutdown of the DME (if this is the second alarm), as appropriate. (See paragraphs 3.1.20 and 3.3.18.)

(2) Alarm on either parameters (e) or (g) shall result in shutdown of 'the DME.

3.4.5.3.2 Key parameter detailed requirements.-

3.4.5.3.2.1 Reply delay monitor.- The reply delay monitor shall measure the position of reply pulses transmitted in response 'to the higher-level outputs of the interrogation signal generator (paragraph 3.4.5.4). The fault threshold point shall be reached whenever the reply delay (3.1.27) deviates from its nominal setting by ±0.6 (±0.2) microsecond and more. The performance of the reply delay monitor shall not be sensitive to the interrogation rate of the monitor signal generator nor to the percentage of replies to monitor interrogation for reply efficiencies as low as 50 percent. The reply delay monitor shall, however, provide a count of the number of replies to monitor interrogation and provide a measure of reply efficiency for remote maintenance monitoring purposes. False alarm data collection may be inhibited during identification for a period of time not to exceed 5 seconds.

3.4.5.3.2.2 Output pulse spacing monitor.- The output pulse spacing monitor shall measure the spacing of the transponder output pulse pairs. (3.4.4.4.2). The fault threshold shall be reached whenever the spacing deviates from the nominal value for the channel assigned (12.0 or 30.0 microseconds) by ±0.4 (±0.2) microsecond and more. False alarm data collection may be inhibited during identification for a period of time not to exceed 5 seconds.

3.4.5.3.2.3 Receiver sensitivity monitor.- The receiver sensitivity monitor shall measure the percentage of replies transmitted in response to the lower-level outputs of the interrogation signal generator (paragraph 3.4.5.4). The fault threshold level shall be adjustable between the limits of 50 to 70 percent. The adjustment shall either be continuous or in increments of not greater than 2.5 percent. Fault (and alarm) conditions shall be provided in accordance with the following.

(a) Within 15 seconds (90 percent confidence level) when the true reply efficiency is 10 percentage points below the threshold setting.

(b) Within 30 seconds (90 percent confidence level) when the true reply efficiency is 5 percentage points below the threshold setting.

(c) Within 30 seconds (50 percent confidence level) when the true reply efficiency is 2.5 percentage points below the threshold level.

alarm) of redundant encoder circuitry, in the transponder (where so equipped), or in the shutdown of the DME (if this is the second alarm), as appropriate. (See paragraphs 3.1.20 and 3.3.18.)

(2) Alarm on either parameters (e) or (g) shall result in shutdown of 'the DME.

3.4.5.3.2 Key parameter detailed requirements.-

3.4.5.3.2.1 Reply delay monitor.- The reply delay monitor shall measure the position of reply pulses transmitted in response 'to the higher-level outputs of the interrogation signal generator (paragraph 3.4.5.4). The fault threshold point shall be reached whenever the reply delay (3.1.27) deviates from its nominal setting by ±0.6 (±0.2) microsecond and more. The performance of the reply delay monitor shall not be sensitive to the interrogation rate of the monitor signal generator nor to the percentage of replies to monitor interrogation for reply efficiencies as low as 50 percent. The reply delay monitor shall, however, provide a count of the number of replies to monitor interrogation and provide a measure of reply efficiency for remote maintenance monitoring purposes. False alarm data collection may be inhibited during identification for a period of time not to exceed 5 seconds.

3.4.5.3.2.2 Output pulse spacing monitor.- The output pulse spacing monitor shall measure the spacing of the transponder output pulse pairs. (3.4.4.4.2). The fault threshold shall be reached whenever the spacing deviates from the nominal value for the channel assigned (12.0 or 30.0 microseconds) by ±0.4 (±0.2) microsecond and more. False alarm data collection may be inhibited during identification for a period of time not to exceed 5 seconds.

3.4.5.3.2.3 Receiver sensitivity monitor.- The receiver sensitivity monitor shall measure the percentage of replies transmitted in response to the lower-level outputs of the interrogation signal generator (paragraph 3.4.5.4). The fault threshold level shall be adjustable between the limits of 50 to 70 percent. The adjustment shall either be continuous or in increments of not greater than 2.5 percent. Fault (and alarm) conditions shall be provided in accordance with the following.

(a) Within 15 seconds (90 percent confidence level) when the true reply efficiency is 10 percentage points below the threshold setting.

(b) Within 30 seconds (90 percent confidence level) when the true reply efficiency is 5 percentage points below the threshold setting.

(c) Within 30 seconds (50 percent confidence level) when the true reply efficiency is 2.5 percentage points below the threshold level.

3.4.5.4.5 RF output pulse spacing.- In the normal mode of operation the signal generator output pulse spacing shall be in accordance with paragraph 3.1.26.4 except that the tolerance shall be ±0.2 microsecond in lieu of ±0.5 micro-second, For test purposes the spacing shall be capable-of variation throughout the range of zero through ±3.2 microseconds removed from the nominal assigned channel spacing in increments of not less than 0.1 microsecond nor greater than 0.2 microsecond.

3.4.5.4.6 RF output level.- The signal generator shall be capable of providing RF output pulse levels at the output connector throughout the range of 0 dBm through -80 dBm (-30 dBm through -110 dBm at the transponder receiver input) (see 3.4.5.2.1). A stability of ±1.0 dB shall apply to any selected output level. During normal-monitoring operation the signal generator shall provide two fixed levels of output on a time sharing basis, a high level output for the monitoring of reply delay (3.4.5.3.2.1) and a lower level output for the monitoring of receiver sensitivity (3.4.5.3.2.3).

3.4.5.4.6.1 High output level.- The high output level shall be set at -30 dBm (-60 dBm at the transponderreceiver input).

3.4.5.4.6.2 Low output level.- The low output level shall have a range of initial adjustment between -25 dBm and -80 dBm (-55 dBm and -110 dBm at the transponder input).

3.4.5.4.6.3 Test output levels.- During test operation the signal generator shall provide pulsed or CW outputs at the various levels required for the measurementof transponder receiver performance requirements of paragraphs 3.4.4.3.7.1, through 3.4.4.3.7.2 and 3.4.4.3.7.3 (b) and (d).

NOTE: During test operation the signal generator shall not be required to provide time shared outputs. Accomplishment of measurements corresponding to paragraphs 3.4.4.3.7.1.1, 3.4.4.3.7.1.3, and 3.4.4.3.7.1.4 presume the use of two signal generators and are therefore required in the dual monitor configuration.

3.4.5.4.7 Output PRF.- The output PRF in the normal monitor mode of operation shall not exceed 30 pps, of which up to 80 percent shall be permitted to be at the low output level (3.4.5.4.6.2) and as few as 20 percent shall be permitted to be at the high output level (3.4.5.4.6.1). In the test mode of operation for those measurements involving the percentage of replies to desired signals the number of interrogations shall not exceed 400 pps. For tests requiring the simulation of traffic loading or undesired off-channel pulses, the signal generator shall be capable of providing output pulse rates anywhere within the range of 10 through 10,000 pps. Output pulse pairs provided in this last mode of operation shall be random in occurrence (i.e., the pulse spacing distribution shall be approximately exponential).

3.4.5.4.5 RF output pulse spacing.- In the normal mode of operation the signal generator output pulse spacing shall be in accordance with paragraph 3.1.26.4 except that the tolerance shall be ±0.2 microsecond in lieu of ±0.5 micro-second, For test purposes the spacing shall be capable-of variation throughout the range of zero through ±3.2 microseconds removed from the nominal assigned channel spacing in increments of not less than 0.1 microsecond nor greater than 0.2 microsecond.

3.4.5.4.6 RF output level.- The signal generator shall be capable of providing RF output pulse levels at the output connector throughout the range of 0 dBm through -80 dBm (-30 dBm through -110 dBm at the transponder receiver input) (see 3.4.5.2.1). A stability of ±1.0 dB shall apply to any selected output level. During normal-monitoring operation the signal generator shall provide two fixed levels of output on a time sharing basis, a high level output for the monitoring of reply delay (3.4.5.3.2.1) and a lower level output for the monitoring of receiver sensitivity (3.4.5.3.2.3).

3.4.5.4.6.1 High output level.- The high output level shall be set at -30 dBm (-60 dBm at the transponderreceiver input).

3.4.5.4.6.2 Low output level.- The low output level shall have a range of initial adjustment between -25 dBm and -80 dBm (-55 dBm and -110 dBm at the transponder input).

3.4.5.4.6.3 Test output levels.- During test operation the signal generator shall provide pulsed or CW outputs at the various levels required for the measurementof transponder receiver performance requirements of paragraphs 3.4.4.3.7.1, through 3.4.4.3.7.2 and 3.4.4.3.7.3 (b) and (d).

NOTE: During test operation the signal generator shall not be required to provide time shared outputs. Accomplishment of measurements corresponding to paragraphs 3.4.4.3.7.1.1, 3.4.4.3.7.1.3, and 3.4.4.3.7.1.4 presume the use of two signal generators and are therefore required in the dual monitor configuration.

3.4.5.4.7 Output PRF.- The output PRF in the normal monitor mode of operation shall not exceed 30 pps, of which up to 80 percent shall be permitted to be at the low output level (3.4.5.4.6.2) and as few as 20 percent shall be permitted to be at the high output level (3.4.5.4.6.1). In the test mode of operation for those measurements involving the percentage of replies to desired signals the number of interrogations shall not exceed 400 pps. For tests requiring the simulation of traffic loading or undesired off-channel pulses, the signal generator shall be capable of providing output pulse rates anywhere within the range of 10 through 10,000 pps. Output pulse pairs provided in this last mode of operation shall be random in occurrence (i.e., the pulse spacing distribution shall be approximately exponential).

3.4.5.4.5 RF output pulse spacing.- In the normal mode of operation the signal generator output pulse spacing shall be in accordance with paragraph 3.1.26.4 except that the tolerance shall be ±0.2 microsecond in lieu of ±0.5 micro-second, For test purposes the spacing shall be capable-of variation throughout the range of zero through ±3.2 microseconds removed from the nominal assigned channel spacing in increments of not less than 0.1 microsecond nor greater than 0.2 microsecond.

3.4.5.4.6 RF output level.- The signal generator shall be capable of providing RF output pulse levels at the output connector throughout the range of 0 dBm through -80 dBm (-30 dBm through -110 dBm at the transponder receiver input) (see 3.4.5.2.1). A stability of ±1.0 dB shall apply to any selected output level. During normal-monitoring operation the signal generator shall provide two fixed levels of output on a time sharing basis, a high level output for the monitoring of reply delay (3.4.5.3.2.1) and a lower level output for the monitoring of receiver sensitivity (3.4.5.3.2.3).

3.4.5.4.6.1 High output level.- The high output level shall be set at -30 dBm (-60 dBm at the transponderreceiver input).

3.4.5.4.6.2 Low output level.- The low output level shall have a range of initial adjustment between -25 dBm and -80 dBm (-55 dBm and -110 dBm at the transponder input).

3.4.5.4.6.3 Test output levels.- During test operation the signal generator shall provide pulsed or CW outputs at the various levels required for the measurementof transponder receiver performance requirements of paragraphs 3.4.4.3.7.1, through 3.4.4.3.7.2 and 3.4.4.3.7.3 (b) and (d).

NOTE: During test operation the signal generator shall not be required to provide time shared outputs. Accomplishment of measurements corresponding to paragraphs 3.4.4.3.7.1.1, 3.4.4.3.7.1.3, and 3.4.4.3.7.1.4 presume the use of two signal generators and are therefore required in the dual monitor configuration.

3.4.5.4.7 Output PRF.- The output PRF in the normal monitor mode of operation shall not exceed 30 pps, of which up to 80 percent shall be permitted to be at the low output level (3.4.5.4.6.2) and as few as 20 percent shall be permitted to be at the high output level (3.4.5.4.6.1). In the test mode of operation for those measurements involving the percentage of replies to desired signals the number of interrogations shall not exceed 400 pps. For tests requiring the simulation of traffic loading or undesired off-channel pulses, the signal generator shall be capable of providing output pulse rates anywhere within the range of 10 through 10,000 pps. Output pulse pairs provided in this last mode of operation shall be random in occurrence (i.e., the pulse spacing distribution shall be approximately exponential).

conducted on the individual units prior to their assembly into a set.

4.1.3 Requirements to be tested.- All requirements defined in the specification must be verified in the test procedures. These requirements are listed in the Verification Requirements Traceability Matrix (VRTM) contained in Table 2 herein. Another VRTM for the software, independent of the hardware (consistent with the requirements of DOD-STD-2167 and this specification), shall be developed by the contractor.

4.1.4 Master Test Plan.- The contractor shall furnish a Master Test Plan (MTP) in accordance with FAA-STD-024 to the Government for review and approval. The MTP and its associated test plans shall be a coherent and comprehensive demonstration, that all specification requirements contained in the VRTM are satisfied.

4.1.5 VRTM definitions.- The following definitions are provided to clarify terms in the VRTM. This information is to be used by the contractor for preparation of test and evaluation procedures defined in paragraphs 4.1.2 through 4.1.4.

4.1.5.1 Verification Methods.-

(a) Test - Test is a method of verifying performance requirements of subsystem/system or configuration items by quantitative measurement of controlled functional or environmental stimuli. These dynamic measurements are made using standardized laboratory equipment, procedures or other services, then analyzed to determine their compliance.

(b) Demonstration - Demonstration is a method of verifying subsystem/system or configuration item requirements by observing their functional response to dynamic exercising. This qualitative evaluation is made using criteria from technical procedure, excluding measurements. Acceptance is based on pass/fail results.

(c) Inspection - Inspection is a method of verifying acceptability of hardware, software or technical documentation by determining the compliance to requirements by visual examination of condition or content. The criteria for examination is obtained from standards, schematics or affidavits consisting of static-state measurements, inventories or conformance features. The success criteria is pass/fail.

(d) Analysis - Analysis is a method of verifying requirements for hardware or software design by comparing it mathematically (modeling) or otherwise with known scientific and technical principles, procedures or practices. Results of the comparison are used to estimate the capability of the design to meet system and mission requirements. Justification for analysis includes impractical or impossible access to measure-

conducted on the individual units prior to their assembly into a set.

4.1.3 Requirements to be tested.- All requirements defined in the specification must be verified in the test procedures. These requirements are listed in the Verification Requirements Traceability Matrix (VRTM) contained in Table 2 herein. Another VRTM for the software, independent of the hardware (consistent with the requirements of DOD-STD-2167 and this specification), shall be developed by the contractor.

4.1.4 Master Test Plan.- The contractor shall furnish a Master Test Plan (MTP) in accordance with FAA-STD-024 to the Government for review and approval. The MTP and its associated test plans shall be a coherent and comprehensive demonstration, that all specification requirements contained in the VRTM are satisfied.

4.1.5 VRTM definitions.- The following definitions are provided to clarify terms in the VRTM. This information is to be used by the contractor for preparation of test and evaluation procedures defined in paragraphs 4.1.2 through 4.1.4.

4.1.5.1 Verification Methods.-

(a) Test - Test is a method of verifying performance requirements of subsystem/system or configuration items by quantitative measurement of controlled functional or environmental stimuli. These dynamic measurements are made using standardized laboratory equipment, procedures or other services, then analyzed to determine their compliance.

(b) Demonstration - Demonstration is a method of verifying subsystem/system or configuration item requirements by observing their functional response to dynamic exercising. This qualitative evaluation is made using criteria from technical procedure, excluding measurements. Acceptance is based on pass/fail results.

(c) Inspection - Inspection is a method of verifying acceptability of hardware, software or technical documentation by determining the compliance to requirements by visual examination of condition or content. The criteria for examination is obtained from standards, schematics or affidavits consisting of static-state measurements, inventories or conformance features. The success criteria is pass/fail.

(d) Analysis - Analysis is a method of verifying requirements for hardware or software design by comparing it mathematically (modeling) or otherwise with known scientific and technical principles, procedures or practices. Results of the comparison are used to estimate the capability of the design to meet system and mission requirements. Justification for analysis includes impractical or impossible access to measure-

conducted on the individual units prior to their assembly into a set.

4.1.3 Requirements to be tested.- All requirements defined in the specification must be verified in the test procedures. These requirements are listed in the Verification Requirements Traceability Matrix (VRTM) contained in Table 2 herein. Another VRTM for the software, independent of the hardware (consistent with the requirements of DOD-STD-2167 and this specification), shall be developed by the contractor.

4.1.4 Master Test Plan.- The contractor shall furnish a Master Test Plan (MTP) in accordance with FAA-STD-024 to the Government for review and approval. The MTP and its associated test plans shall be a coherent and comprehensive demonstration, that all specification requirements contained in the VRTM are satisfied.

4.1.5 VRTM definitions.- The following definitions are provided to clarify terms in the VRTM. This information is to be used by the contractor for preparation of test and evaluation procedures defined in paragraphs 4.1.2 through 4.1.4.

4.1.5.1 Verification Methods.-

(a) Test - Test is a method of verifying performance requirements of subsystem/system or configuration items by quantitative measurement of controlled functional or environmental stimuli. These dynamic measurements are made using standardized laboratory equipment, procedures or other services, then analyzed to determine their compliance.

(b) Demonstration - Demonstration is a method of verifying subsystem/system or configuration item requirements by observing their functional response to dynamic exercising. This qualitative evaluation is made using criteria from technical procedure, excluding measurements. Acceptance is based on pass/fail results.

(c) Inspection - Inspection is a method of verifying acceptability of hardware, software or technical documentation by determining the compliance to requirements by visual examination of condition or content. The criteria for examination is obtained from standards, schematics or affidavits consisting of static-state measurements, inventories or conformance features. The success criteria is pass/fail.

(d) Analysis - Analysis is a method of verifying requirements for hardware or software design by comparing it mathematically (modeling) or otherwise with known scientific and technical principles, procedures or practices. Results of the comparison are used to estimate the capability of the design to meet system and mission requirements. Justification for analysis includes impractical or impossible access to measure-

conducted on the individual units prior to their assembly into a set.

4.1.3 Requirements to be tested.- All requirements defined in the specification must be verified in the test procedures. These requirements are listed in the Verification Requirements Traceability Matrix (VRTM) contained in Table 2 herein. Another VRTM for the software, independent of the hardware (consistent with the requirements of DOD-STD-2167 and this specification), shall be developed by the contractor.

4.1.4 Master Test Plan.- The contractor shall furnish a Master Test Plan (MTP) in accordance with FAA-STD-024 to the Government for review and approval. The MTP and its associated test plans shall be a coherent and comprehensive demonstration, that all specification requirements contained in the VRTM are satisfied.

4.1.5 VRTM definitions.- The following definitions are provided to clarify terms in the VRTM. This information is to be used by the contractor for preparation of test and evaluation procedures defined in paragraphs 4.1.2 through 4.1.4.

4.1.5.1 Verification Methods.-

(a) Test - Test is a method of verifying performance requirements of subsystem/system or configuration items by quantitative measurement of controlled functional or environmental stimuli. These dynamic measurements are made using standardized laboratory equipment, procedures or other services, then analyzed to determine their compliance.

(b) Demonstration - Demonstration is a method of verifying subsystem/system or configuration item requirements by observing their functional response to dynamic exercising. This qualitative evaluation is made using criteria from technical procedure, excluding measurements. Acceptance is based on pass/fail results.

(c) Inspection - Inspection is a method of verifying acceptability of hardware, software or technical documentation by determining the compliance to requirements by visual examination of condition or content. The criteria for examination is obtained from standards, schematics or affidavits consisting of static-state measurements, inventories or conformance features. The success criteria is pass/fail.

(d) Analysis - Analysis is a method of verifying requirements for hardware or software design by comparing it mathematically (modeling) or otherwise with known scientific and technical principles, procedures or practices. Results of the comparison are used to estimate the capability of the design to meet system and mission requirements. Justification for analysis includes impractical or impossible access to measure-

conducted on the individual units prior to their assembly into a set.

4.1.3 Requirements to be tested.- All requirements defined in the specification must be verified in the test procedures. These requirements are listed in the Verification Requirements Traceability Matrix (VRTM) contained in Table 2 herein. Another VRTM for the software, independent of the hardware (consistent with the requirements of DOD-STD-2167 and this specification), shall be developed by the contractor.

4.1.4 Master Test Plan.- The contractor shall furnish a Master Test Plan (MTP) in accordance with FAA-STD-024 to the Government for review and approval. The MTP and its associated test plans shall be a coherent and comprehensive demonstration, that all specification requirements contained in the VRTM are satisfied.

4.1.5 VRTM definitions.- The following definitions are provided to clarify terms in the VRTM. This information is to be used by the contractor for preparation of test and evaluation procedures defined in paragraphs 4.1.2 through 4.1.4.

4.1.5.1 Verification Methods.-

(a) Test - Test is a method of verifying performance requirements of subsystem/system or configuration items by quantitative measurement of controlled functional or environmental stimuli. These dynamic measurements are made using standardized laboratory equipment, procedures or other services, then analyzed to determine their compliance.

(b) Demonstration - Demonstration is a method of verifying subsystem/system or configuration item requirements by observing their functional response to dynamic exercising. This qualitative evaluation is made using criteria from technical procedure, excluding measurements. Acceptance is based on pass/fail results.

(c) Inspection - Inspection is a method of verifying acceptability of hardware, software or technical documentation by determining the compliance to requirements by visual examination of condition or content. The criteria for examination is obtained from standards, schematics or affidavits consisting of static-state measurements, inventories or conformance features. The success criteria is pass/fail.

(d) Analysis - Analysis is a method of verifying requirements for hardware or software design by comparing it mathematically (modeling) or otherwise with known scientific and technical principles, procedures or practices. Results of the comparison are used to estimate the capability of the design to meet system and mission requirements. Justification for analysis includes impractical or impossible access to measure-

TABLE 2 (continued)

VOR-TACAN-DME CHANNEL FREQUENCIES AND PAIRING

VHF Chan. Freq. MHz	Chan. No.	DME-TACAN Inter. Freq. MHz	DME-TACAN Reply Freq. MHz	VHF Chan. Freq. MHz	Chan. No.	DME-TACAN Inter. Freq. MHz	DME-TACAN Reply Freq. MHz
112.80 VOR	75X	1099	1162	114.70 VOR	94X	1118	1181
112.85 VOR	75Y	1099	1036	114.75 VOR	94Y	1118	1055
112.90 VOR	76X	1100	1163	114.80 VOR	95X	1119	1182
112.95 VOR	76Y	1100	1037	114.85 VOR	95Y	1119	1056
113.00 VOR	77X	1101	1164	114.90 VOR	96X	1120	1183
113.05 VOR	77Y	1101	1038	114.95 VOR	96Y	1120	1057
113.10 VOR	78X	1102	1165	115.00 VQR	97X	1121	1184
113.15 VOW	78Y	1102	1039	115.05 VOR	97Y	1121	1058
113.20 VOR	79X	1103	1166	115.10 VOR	98X	1122	1185
113.25 VOR	79Y	1103	1040	115.15 VOR	98Y	1122	1059
113.30 VOR	80X	1104	1167	115.20 VOR	99X	1123	1186
113.35 VOR	80Y	1104	1041	115.25 VOR	99Y	1123	1060
113.40 VOR	81X	1105	1168	115.30 VOR	100X	1124	1187
113.45 VOR	81Y	1105	1042	115.35 VOR	100Y	1124	1061
113.50 VOR	82X	1106	1169	115.40 VQR	101X	1125	1188
113.55 VOR	82Y	1106	1043	115.45 VOR	101Y	1125	1062
113.60 VOR	83X	1107	1170	115.50 VOR	102X	1126	1189
113.65 VOR	83Y	1107	1044	115.55 VOR	102Y	1126	1063
113.70 VOR	84X	1108	1171	115.60 VOR	103X	1127	1190
113.75 VOR	84Y	1108	1045	115.65 VOR	103Y	1127	1064
113.80 VOR	85X	1109	1172	115.70 VOR	104X	1128	1191
113.85 VOW	85Y	1109	1046	115.75 VOR	104Y	1128	1065
113.90 VOR	86X	1110	1173	115.80 VOR	105X	1129	1192
113.95 VOR	86Y	1110	1047	115.85 VOR	105Y	1129	1066
114.00 VOR	87X	1111	1174	115.90 VOR	106X	1130	1193
114.05 VOR	87Y	1111	1048	115.95 VOR	106Y	1130	1067
114.10 VOR	88X	1112	1175	116.00 VOR	107X	1131	1194
114.15 VOR	88Y	1112	1049	116.05 VQR	107Y	1131	1068
114.20 VOR	89X	1113	1176	116.10 VOR	108X	1132	1195
114.25 VOR	89Y	1113	1050	116.15 VOR	108Y	1132	1069
114.30 VOR	90X	1114	1177	116.20 VOR	109X	1133	1196
114.35 VOR	90Y	1114	1051	116.25 VOR	109Y	1133	1070
114.40 VOR	91X	1115	1178	116.30 VOR	110X	1134	1197
114.45 VOR	91Y	1115	1052	116.35 VOR	110Y	1134	1071
114.50 VOR	92X	1116	1179	116.40 VOR	111X	1135	1198
114.55 VOW	92Y	1116	1053	116.45 VOR	111Y	1135	1072
114.60 VOR	93X	1117	1180	116.50 VOR	112X	1136	1199
114.65 VOR	93Y	1117	1054	116.55 VOR	112Y	1136	1073

TABLE 1 (continued)

VOR-TACAN-DME CHANNEL FREQUENCIES AND PAIRING

VHF Chan. Freq. MHZ		Chan. No.	DME-TACAN Inter. Freq. MHz	Reply Freq. MHz	VHF Chan. Freq. MHz		Chan. No.	DME-TACAN Inter. Freq. MHz	Reply Freq. MHz
112.80	VOR	75X	1099	$152	114!70	VOR	94X	1118	1181
112.85	VOR	75Y	1099	1035	114*75	VOR	94Y	1118	1055
112.90	VOR	76X	1100	1163	ZB4,80	VOR	95X	1119	1182
112.95	VOR	76Y	1100	L037	114!85	VOR	95Y	1119	1056
113.00	VOR	77X	1H0%	1164	114!90	VOR	96X	PI20	1183
113.05	VOR	77Y	1101	1038	114.95	VOR	96Y	1120	1057
113.10	VOR	78X	1102	1165	115.00	VOR	97X	EL21	I184
113.15	VOR	78Y	1102	1039	115*05	VOR	97Y	I12R	P058
113.20	VOR	79X	1203	1156	115010	VOR	98X	1122	1185
113.25	VOR	79Y	1103	P040	115,315	VOR	98Y	1P22	1059
113.30	VOR	80X	1104	P267	115,20	VOR	99X	1223	1186
113.35	VOR	80Y	1104	1041	115025	VOR	99Y	1123	1060
113.40	VOR	81X	IL05	1158	%35*30	VOR	100X	1124	1187
113.45	VOR	81Y	1L05	1042	E15,35	VOR	1Q0Y	XL24	I061
113.50	VOR	82X	PI06	1169	115.40	VQR	101X	1125	1188
113.55	VOR	82Y	1106	1043	a15*45	VOR	k01Y	1225	1062
113.60	VOR	83X	I107	1170	PE4*50	VOR	102X	EL26	1189
113.65	VOR	83Y	1107	1044	Pk5.55	VOR	1Q2Y	1126	1063
113.70	VOR	84X	1%$38	I2?1	%15,60	VOR	103X	I127	1190
113.75	VOR	84Y	1108	2045	I15.65	VOR	103Y	1127	1064
113.80	VOR	85X	IL09	41172	1%5*70	VOR	104X	1128	1191
113.85	VOR	85Y	1109	I046	115.75	VOR	104Y	1128	1065
113.90	VOR	86X	1110	1173	P15.80	VOR	105X	1129	1192
113.95	VOR	86Y	a110	1047	115,85	VOR	P05Y	1129	1066
114.00	VOR	87X	1H1%	1174	115*90	VOR	106X	I130	1193
114.05	VOR	87Y	1111	1048	i'EL95	VOR	106Y	XL30	1067
114.10	VOR	88X	1112	1175	116!00	VOR	107X	tL3a	1194
114.15	VOR	88Y	1112	1049	116.05	VQR	107Y	1131	1068
114.20	VOR	89X	1113	1176	116.1@	VOR	108X	i132	1195
114.25	VOR	89Y	1113	1050	116.15	VOR	108Y	1132	1069
114.30	VOR	90X	PL14	1177	116.20	VOR	109X	1133	1196
114.35	VOR	90Y	1114	2051	EL6,25	VOR	109Y	I133	a070
114.40	VOR	91X	1115	I178	1%6,30	VOR	110X	1134	1197
114.45	VOR	91Y	1115	2052	116.35	VOR	110Y	i134	1071
114.50	VOR	92X	1116	1179	E16.40	VOR	111X	I135	1198
114.55	VOW	92Y	HPB6	P053	116,45	VOR	111Y	1135	1072
114.60	VOR	93X	UP17	1180	%16,50	VOR	112X	1136	1199
114.65	VOR	93Y	1117	1054	116,55	VOR	112Y	E136	1073

TABLE 1 (continued)

VOR-TACAN-DME CHANNEL FREQUENCIES AND PAIRING

VHF Chan. Freq. MHz		Chan. NO.	DME-TACAN Inter. Freq. MHz	DME-TACAN Reply Freq. MHz	VHF Chan. Freq. MHz		Chan. No.	DME-TACAN Inter. Freq. MHz	DME-TACAN Reply Freq. MHz
112.80	VOR	75X	1099	$162	114.70	VOR	94X	1118	1181
112.85	VOR	75Y	1099	1036	114.75	VOR	94Y	1118	1055
112.90	VOR	76X	1100	%863	ZB4,80	VOR	95X	H1%9	1182
112.95	VOR	76Y	1100	1037	114.85	VOR	95Y	1119	1056
113.00	VOR	77X	1H0%	1164	114.90	VOR	96X	PI20	1183
113.05	VOR	77Y	1101	1038	HA.95	VOR	96Y	1120	1057
113.10	VOR	78X	I102	1165	295.00	VOR	97X	I121	1184
113.15	VOR	78Y	1102	1039	115*05	VOR	97Y	112R	P058
113.20	VOR	79X	6203	1156	115010	VOR	98X	1122	1185
113.25	VOR	79Y	1103	P040	115,315	VOR	98Y	1122	1059
113.30	VOR	80X	1104	P267	115.20	VOR	99X	1223	1186
113.35	VOR	80Y	1104	1041	115025	VOR	99Y	1123	1060
113.40	VOR	81X	1105	1158	%35.30	VOR	100X	1124	1187
113.45	VOR	81Y	1105	1042	115.35	VOR	1Q0Y	1124	1061
113.50	VOR	82X	PI06	I169	115.40	VQR	101X	1125	1188
113.55	VOR	82Y	1106	1043	a15.45	VOR	101Y	1225	1062
113.60	VOR	83X	1107	1170	114.50	VOR	102X	E126	1189
113.65	VOR	83Y	1107	1044	P15.55	VOR	1Q2Y	1126	1063
113.70	VOR	84X	1108	1171	I15.60	VOR	103X	I127	1190
113.75	VOR	84Y	1108	2045	I15.65	VOR	103Y	1127	1064
113.80	VOR	85X	I109	1172	115.70	VOR	104X	1128	1191
113.85	VOW	85Y	1109	I046	115.75	VOR	104Y	1128	1065
113.90	VOR	86X	1110	1173	P15.80	VOR	105X	1129	1192
113.95	VOR	86Y	a110	1047	115,85	VOR	P05Y	1129	1066
114.00	VOR	87X	1H1%	1174	115.90	VOR	106X	1130	1193
114.05	VOR	87Y	1111	1048	i1EL95	VOR	106Y	1130	1067
114.10	VOR	88X	IA112	1175	116.00	VOR	107X	1131	1194
114.15	VOR	88Y	1112	1049	116.05	VQR	107Y	1131	1068
114.20	VOR	89X	1113	1176	116.10	VOR	108X	1132	1195
114.25	VOR	89Y	1113	1050	116.15	VOR	108Y	1132	1069
114.30	VOR	90X	P114	1177	116.20	VOR	109X	1133	1196
114.35	VOR	90Y	1114	205Y	EL6,25	VOR	109Y	I133	1070
114.40	VOR	91X	1115	I178	116,30	VOR	110X	1134	1197
114.45	VOR	91Y	1115	1052	116.35	VOR	110Y	1134	1071
114.50	VOR	92X	1116	1179	E16.40	VOR	111X	I135	1198
114.55	VOW	92Y	1116	P053	116,45	VOR	H11Y	1135	1072
114.60	VOR	93X	UP17	1180	116.50	VOR	112X	1136	1199
114.65	VOR	93Y	1117	1054	116.55	VOR	112Y	E136	1073

TABLE 1 (continued)

VOR-TACAN-DME CHANNEL FREQUENCIES AND PAIRING

VHF Chan. Freq. MHz		Chan. No.	DME-TACAN Inter. Freq. MHz	DME-TACAN Reply Freq. MHz	VHF Chan. Freq. MHz		Chan. No.	DME-TACAN Inter. Freq. MHz	DME-TACAN Reply Freq. MHz
112.80	VOR	75X	1099	1162	114.70	VOR	94X	1118	1181
112.85	VOR	75Y	1099	1036	114.75	VOR	94Y	1118	1055
112.90	VOR	76X	1100	1163	114.80	VOR	95X	1119	1182
112.95	VOR	76Y	1100	1037	114.85	VOR	95Y	1119	1056
113.00	VOR	77X	1101	1164	114.90	VOR	96X	1120	1183
113.05	VOR	77Y	1101	1038	114.95	VOR	96Y	1120	1057
113.10	VOR	78X	1102	1165	115.00	VOR	97X	1121	1184
113.15	VOR	78Y	1102	1039	115.05	VOR	97Y	1121	1058
113.20	VOR	79X	1103	1166	115.10	VOR	98X	1122	1185
113.25	VOR	79Y	1103	1040	115.15	VOR	98Y	1122	1059
113.30	VOR	80X	1104	1167	115.20	VOR	99X	1123	1186
113.35	VOR	80Y	1104	1041	115.25	VOR	99Y	1123	1060
113.40	VOR	81X	1105	1168	115.30	VOR	100X	1124	1187
113.45	VOR	81Y	1105	1042	115.35	VOR	100Y	1124	1061
113.50	VOR	82X	1106	1169	115.40	VOR	101X	1125	1188
113.55	VOR	82Y	1106	1043	115.45	VOR	101Y	1125	1062
113.60	VOR	83X	1107	1170	115.50	VOR	102X	1126	1189
113.65	VOR	83Y	1107	1044	115.55	VOR	102Y	1126	1063
113.70	VOR	84X	1108	1171	115.60	VOR	103X	1127	1190
113.75	VOR	84Y	1108	1045	115.65	VOR	103Y	1127	1064
113.80	VOR	85X	1109	1172	115.70	VOR	104X	1128	1191
113.85	VOW	85Y	1109	1046	115.75	VOR	104Y	1128	1065
113.90	VOR	86X	1110	1173	115.80	VOR	105X	1129	1192
113.95	VOR	86Y	1110	1047	115.85	VOR	105Y	1129	1066
114.00	VOR	87X	1111	1174	115.90	VOR	106X	1130	1193
114.05	VOR	87Y	1111	1048	115.95	VOR	106Y	1130	1067
114.10	VOR	88X	1112	1175	116.00	VOR	107X	1131	1194
114.15	VOR	88Y	1112	1049	116.05	VOR	107Y	1131	1068
114.20	VOR	89X	1113	1176	116.10	VOR	108X	1132	1195
114.25	VOR	89Y	1113	1050	116.15	VOR	108Y	1132	1069
114.30	VOR	90X	1114	1177	116.20	VOR	109X	1133	1196
114.35	VOR	90Y	1114	1051	116.25	VOR	109Y	1133	1070
114.40	VOR	91X	1115	1178	116.30	VOR	110X	1134	1197
114.45	VOR	91Y	1115	1052	116.35	VOR	110Y	1134	1071
114.50	VOR	92X	1116	1179	116.40	VOR	111X	1135	1198
114.55	VOW	92Y	1116	1053	116.45	VOR	111Y	1135	1072
114.60	VOR	93X	1117	1180	116.50	VOR	112X	1136	1199
114.65	VOR	93Y	1117	1054	116.55	VOR	112Y	1136	1073

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.3.17	Stabilization of perf. chars and Mon. Res Time	T		T			X		
3.3.18	Reliability of electronic equipment	A,D					X		
3.3.18.1	DME MTBF	A					X		
3.3.19.1	Maintenance Concept	A					X		
3.3.19.2	Preventive maintenance time	A					X		
3.3.19.3	Corrective maintenance time	A,D					X		
3.3.20.1	Reliability program	I					X		
3.3.20.2	Maintainability program	I					X		
3.4.2	DME Compatibility requirements	D,T					X		
3.4.3	DME RMS requirements	D,T					X		
3.4.3.1	DME RMS functions	D,T			D		X		
3.4.3.2	IOT interface commands	T				T	X	X	
3.4.3.3	Protocol	A,T					X		
3.4.3.4	Memory	A					X		
3.4.3.5	Volatility	A					X		
3.4.3.6	Alarm and message format	D					X		

VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION--D

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.3.17	Stabilization of perf. chars and Mon. Res Time	T		T			X		
3.3.18	Reliability of electronic equipment	A,D					X		
3.3.18.1	DME MTBF	A					X		
3.3.19.1	Maintenance Concept	A					X		
3.3.19.2	Preventive maintenance time	A					X		
3.3.19.3	Corrective maintenance time	A,D					X		
3.3.20.1	Reliability program	I					X		
3.3.20.2	Maintainability program	I					X		
3.4.2	DME Compatibility requirements	D,T					X		
3.4.3	DME RMS requirements	D,T					X		
3.4.3.1	DME RMS functions	D,T			D		X		
3.4.3.2	IOT interface commands	T				T	X	X	
3.4.3.3	Protocol	A,T					X		
3.4.3.4	Memory	A					X		
3.4.3.5	Volatility	A					X		
3.4.3.6	Alarm and message format	D					X		

VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION--D

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.3.17	Stabilization of perf. chars and Mon. Res Time	T		T			X		
3.3.18	Reliability of electronic equipment	A,D					X		
3.3.18.1	DME MTBF	A					X		
3.3.19.1	Maintenance Concept	A					X		
3.3.19.2	Preventive maintenance time	A					X		
3.3.19.3	Corrective maintenance time	A,D					X		
3.3.20.1	Reliability program	I					X		
3.3.20.2	Maintainability program	I					X		
3.4.2	DME Compatibility requirements	D,T					X		
3.4.3	DME RMS requirements	D,T					X		
3.4.3.1	DME RMS functions	D,T			D		X		
3.4.3.2	IOT interface commands	T				T	X	X	
3.4.3.3	Protocol	A,T					X		
3.4.3.4	Memory	A					X		
3.4.3.5	Volatility	A					X		
3.4.3.6	Alarm and message format	D					X		
VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION--D									

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.3.17	Stabilization of perf. chars and Mon. Res Time	T		T			X		
3.3.18	Reliability of electronic equipment	A,D					X		
3.3.18.1	DME MTBF	A					X		
3.3.19.1	Maintenance Concept	A					X		
3.3.19.2	Preventive maintenance time	A					X		
3.3.19.3	Corrective maintenance time	A,D					X		
3.3.20.1	Reliability program	I					X		
3.3.20.2	Maintainability program	I					X		
3.4.2	DME Compatibility requirements	D,T					X		
3.4.3	DME RMS requirements	D,T					X		
3.4.3.1	DME RMS functions	D,T			D		X		
3.4.3.2	IOT interface commands	T				T	X	X	
3.4.3.3	Protocol	A,T					X		
3.4.3.4	Memory	A					X		
3.4.3.5	Volatility	A					X		
3.4.3.6	Alarm and message format	D					X		

VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION--D

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.3.17	Stabilization of perf. chars and Mon. Res Time	T		T			X		
3.3.18	Reliability of electronic equipment	A,D					X		
3.3.18.1	DME MTBF	A					X		
3.3.19.1	Maintenance Concept	A					X		
3.3.19.2	Preventive maintenance time	A					X		
3.3.19.3	Corrective maintenance time	A,D					X		
3.3.20.1	Reliability program	I					X		
3.3.20.2	Maintainability program	I					X		
3.4.2	DME Compatibility requirements	D,T					X		
3.4.3	DME RMS requirements	D,T					X		
3.4.3.1	DME RMS functions	D,T			D		X		
3.4.3.2	IOT interface commands	T				T	X	X	
3.4.3.3	Protocol	A,T					X		
3.4.3.4	Memory	A					X		
3.4.3.5	Volatility	A					X		
3.4.3.6	Alarm and message format	D					X		

VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION--D

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.4.5.2.2.1	Antenna transmission line/transponder output	D					X		
3.4.5.2.2.1.1	RF input levels	D					X		
3.4.5.2.2.2.1	DME antenna coupl. probes	T					X		
3.4.5.2.3	Directional couplers	T		T			X		
3.4.5.3	Key monitored signal param.	T			T	T	X	X	
3.4.5.3.1	Executive mon. alarm action	T			T	T	X	X	
3.4.5.3.2.1	Reply delay monitor	T			T	T	X	X	
3.4.5.3.2.2	Output pulse spacing monitor	T			T	T	X	X	
3.4.5.3.2.3	Receiver sensitivity monitor	T		T	T	T	X	X	
3.4.5.3.2.4	Transp. pulse rate monitor	T			T	T	X	X	
3.4.5.3.2.5	Transp. power output monitor	T			T	T	X	X	
3.4.5.3.2.6	Identification keying monitor	T			T	T	X	X	
3.4.5.3.2.7	Radiated power level monitor	T			T	T	X	X	
3.4.5.3.3	Alarm delay	T			T		X		
3.4.5.4	Interrogation signal gen.	D					X		
3.4.5.4.1	RF output frequencies	D					X		
VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION-D									

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.4.5.2.2.1	Antenna transmission line/transponder output	D					X		
3.4.5.2.2.1.1	RF input levels	D					X		
3.4.5.2.2.2.1	DME antenna coupl. probes	T					X		
3.4.5.2.3	Directional couplers	T		T			X		
3.4.5.3	Key monitored signal param.	T			T	T	X	X	
3.4.5.3.1	Executive mon. alarm action	T			T	T	X	X	
3.4.5.3.2.1	Reply delay monitor	T			T	T	X	X	
3.4.5.3.2.2	Output pulse spacing monitor	T			T	T	X	X	
3.4.5.3.2.3	Receiver sensitivity monitor	T		T	T	T	X	X	
3.4.5.3.2.4	Transp. pulse rate monitor	T			T	T	X	X	
3.4.5.3.2.5	Transp. power output monitor	T			T	T	X	X	
3.4.5.3.2.6	Identification keying monitor	T			T	T	X	X	
3.4.5.3.2.7	Radiated power level monitor	T			T	T	X	X	
3.4.5.3.3	Alarm delay	T			T		X		
3.4.5.4	Interrogation signal gen.	D					X		
3.4.5.4.1	RF output frequencies	D					X		

VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION-D

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2 DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX									
REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.4.5.2.2.1	Antenna transmission line/transponder output	D					X		
3.4.5.2.2.1.1	RF input levels	D					X		
3.4.5.2.2.2.1	DME antenna coupl. probes	T					X		
3.4.5.2.3	Directional couplers	T		T			X		
3.4.5.3	Key monitored signal param.	T			T	T	X	X	
3.4.5.3.1	Executive mon. alarm action	T			T	T	X	X	
3.4.5.3.2.1	Reply delay monitor	T			T	T	X	X	
3.4.5.3.2.2	Output pulse spacing monitor	T			T	T	X	X	
3.4.5.3.2.3	Receiver sensitivity monitor	T		T	T	T	X	X	
3.4.5.3.2.4	Transp. pulse rate monitor	T			T	T	X	X	
3.4.5.3.2.5	Transp. power output monitor	T			T	T	X	X	
3.4.5.3.2.6	Identification keying monitor	T			T	T	X	X	
3.4.5.3.2.7	Radiated power level monitor	T			T	T	X	X	
3.4.5.3.3	Alarm delay	T			T		X		
3.4.5.4	Interrogation signal gen.	D					X		
3.4.5.4.1	RF output frequencies	D					X		
VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION-D									

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT

TABLE 2
DME SYSTEM - VERIFICATION REQUIREMENT TRACEABILITY MATRIX

REQUIREMENTS		TEST LEVEL AND METHOD					TEST LOCATION		REMARKS
* I	TITLE	* II	* III	* IV	* V	* VI	* VII	* VIII	
3.4.5.2.2.1	Antenna transmission line/transponder output	D					X		
3.4.5.2.2.1.1	RF input levels	D					X		
3.4.5.2.2.2.1	DME antenna coupl. probes	T					X		
3.4.5.2.3	Directional couplers	T		T			X		
3.4.5.3	Key monitored signal param.	T			T	T	X	X	
3.4.5.3.1	Executive mon. alarm action	T			T	T	X	X	
3.4.5.3.2.1	Reply delay monitor	T			T	T	X	X	
3.4.5.3.2.2	Output pulse spacing monitor	T			T	T	X	X	
3.4.5.3.2.3	Receiver sensitivity monitor	T		T	T	T	X	X	
3.4.5.3.2.4	Transp. pulse rate monitor	T			T	T	X	X	
3.4.5.3.2.5	Transp. power output monitor	T			T	T	X	X	
3.4.5.3.2.6	Identification keying monitor	T			T	T	X	X	
3.4.5.3.2.7	Radiated power level monitor	T			T	T	X	X	
3.4.5.3.3	Alarm delay	T			T		X		
3.4.5.4	Interrogation signal gen.	D					X		
3.4.5.4.1	RF output frequencies	D					X		
VERIFICATION METHOD: INSPECTION-I, ANALYSIS-A, TEST-T, DEMONSTRATION-D									

* I PARAGRAPH NUMBER, II FIRST DESIGN QUALIFICATION, III TYPE TEST NORMAL CONDITIONS, IV TYPE TEST SERVICE CONDITIONS, V PRODUCTION TESTS, VI OPERATIONAL SHAKEDOWN, VII FACTORY, VIII ASM-600/ACT